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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Law and Power Station Fumes

THE House of Lords judgment on the action against the Manchester Corporation, the public controversy on the atmospheric effects of the Battersea Power Station, and the recent reports by the Government Committee and by two private consultants, all indicate that the problem of fumes from modern large power stations can no longer be ignored. By chemical engineers the concentration of public interest on the matter will be welcomed. The problem is clearly within their special province, and the processes involved in its successful treatment not only enlarge their practice but promise valuable results in safeguarding the public against polluted atmospheres, and in avoiding nuisances which, if uncorrected, might seriously handicap industrial developments.

Expert authorities refuse to regard any difficulties that may have occurred in the past as insoluble. They are inclined to attribute them to the neglect to apply remedial measures. The emphatic terms in which the House of Lords has pronounced against any further neglect of this kind place on power station authorities the obligation to do all that can be done for public and private protection. The question, therefore, seems to resolve itself into one, first, of treatment and, next, of expense. Opinions have been expressed by competent judges that the cost need not be prohibitive, but no exact figures are available as to the proportion that the cost of efficient purification plant would bear to the total expenditure. Clearly, the costing aspect of the matter will have to be taken seriously.

From the chemical point of view, the report of the Government Committee is of the very greatest importance. It is, as we might expect, cautious in its findings, but so far as they go they seem to confirm the confidence of chemical engineers in their ability to purify the fumes. First, the Committee allow that by the use of water sprays it is possible to eliminate from the gases of combustion nearly the whole of the sulphur gases present. In an inspection of experimental arrangements as recently as last July, neither acid taste nor objectionable odour could be detected by breathing the undiluted gases from the exit flue. During an experimental run, the absorption of about 95 per cent. of the sulphur acids in the flue gases was confirmed.

From these premises concerning experimental tests, we should not expect experts like Sir Robert Robertson, Dr. Lander, Mr. Macintyre and Dr. Lewis Bailey to jump to final conclusions. But they regard the results as "promising," and while naturally awaiting the final results, they see no inherent reason why similar results to those yielded by the experiments they examined should not be obtained from the larger experimental plant now being erected on the lines of the proposed installation at Battersea. The treatment of the condenser water, also, so as to restore a sufficient degree of alkalinity to the water returned to the Thames does not suggest to them any fatal difficulty. The independent report of Dr. Ardern and Professor Wheeler is not, it is true, an official document, but their opinions, as consultants, will carry considerable weight. From the chemical and chemical engineering aspects, therefore, the difficulties would not appear to be incapable of successful treatment.

The judgment delivered by Lords Dunedin, Sumner and Blanesburgh on the Barton power station action is certain, in accordance with the hope expressed by Lord Dunedin, to "attract public attention, for assuredly the dangers it discloses are a matter of great importance to thousands of people." As we read it, it means that while any authority, authorised to do a certain thing, cannot be held liable for nuisances proved to be inevitable in the process, the onus of proving that all possible means of prevention, according to the existing state of scientific knowledge, have been employed, is most definitely thrown upon the authorities themselves. Authorities engaged in the erection of great power stations in the future will no doubt have this judgment very clearly in mind when their installations are being planned, and will take the fullest measures for complying with its terms in advance. The judgment would, however, equally apply to any older

and smaller existing stations where those responsible for the design and working may have "never considered, when designing, the effect it would have on the neighbourhood, and never asked or obtained outside advice from those skilled in such matters." In case of complaint or legal proceedings, the Lords' judgment throws on such concerns the consequences of any neglect in this direction, and the duty of introducing the best known remedial measures.

The Chemistry of Wood Preservation

THE gathering that met in London on Tuesday and unanimously decided to form a Wood Preserving Association was remarkably representative of growers, importers, merchants, users, and various other interests concerned with timber. It was a surprise to find so many branches of industry directly or indirectly affected by the proposal, and such complete unanimity among so many different groups as to the need of better methods of wood preservation, their more general adoption, and the advantage of standard specifications for wood preservatives and their application. As in so many similar cases, the discussion very soon made it clear that, once the principle of the advantages of wood preservation is accepted, the matter becomes fundamentally a chemical problem, in the solution of which research is a vital factor.

The need for a concerted effort for the better preservation of timber appeared so obvious that the inaction of the past seemed almost unaccountable. What is obviously required is a general plan for public education as to both its utility and its urgency. One Government official of long experience, for example, pointed out that the life of a house is mainly determined by the life of its timbers, yet in hundreds of cases he had inspected he found the woodwork entirely composed of untreated timber. There is a wastage of material here wholly out of proportion to the initial cost of treatment. And the same is true in numerous other directions.

The movement touches the chemical industry closely at many points, and it was satisfactory to find this side so well represented by associations, firms, and research organisations. The Association of British Chemical Manufacturers, with its wide experience of such matters, should be of great assistance in the work of organisation, and the co-operation of gas companies, tar distillers, creosote manufacturers, makers of preservative preparations, and chemical firms generally assures the new association of a strong backing from the beginning.

Limitation of Chilean Nitrate Production

SUGGESTIONS have been made lately in various quarters that the limitation of production of sodium nitrate in Chile is under consideration, and at the meeting of the Lagunas Syndicate on Thursday, November 28, Mr. F. Watson said that conversations on the subject were taking place at Valparaiso. The *Financial News* gives the following details of the direction in which the conversations are proceeding :—

The excess production of Chilean nitrate beyond the present world demand is estimated to be between 400,000 tons and 500,000 tons annually. By the closing down of the less efficient producers it should be possible to eliminate this excess. It is proposed, therefore, that the expensive producers shall be invited to close down their plants, under a system of bonus compensation from the producers who continue in production. Applications for inclusion in the scheme will be received up to January 31, 1930, from producers representing an aggregate output of up to 400,000 tons per annum.

After February 1, 1930, the producers who close down their plant under the scheme will be allowed to dispose of their accumulated stocks in the normal way under the central selling scheme. It is calculated that the stocks of these producers should be disposed of by the beginning of the next nitrate year on July 1, 1930. After a producer's stocks have been sold the compensation scheme will come into operation, by which he will receive from the producers still working payment at the rate of 6d. for every metric quintal of his 1928-29 production. This compensation will be paid out of a levy on the working producers, which is expected to be about ·94d. per quintal of their output. The subvention is only to be paid for one year from July 1, 1930. The producers who close down, however, must agree to remain closed for two full nitrate years, that is, until June 30, 1932. After that it is hoped that consumption will have expanded sufficiently to allow their reopening.

The Calendar

9	Institute of Metals (Scottish Section): "Melting Furnaces." G. L. Cassidy. 7.30 p.m.	39, ElmbankCrescent, Glasgow.
10	Institution of Petroleum Technologists. 5.30 p.m.	House of the Royal Society of Arts, Adelphi, London.
11	Institute of Chemistry and Society of Chemical Industry (Edinburgh Sections) : "The Industrial Minerals of Scotland." J. Adam Watson. 7.30 p.m.	North British Station Hotel, Edinburgh.
11	Society of Chemical Industry (Newcastle Section) : "The Manipulation of Gas." L. H. Sensicle. 7.30 p.m.	Armstrong College, Newcastle.
12	Chemical Society : Liversidge Lecture : "Surface Forces and Chemical Equilibria." Professor Dr. H. Freundlich. 5.30 p.m.	Hall of Institution of Mechanical Engineers, Storey's Gate, London.
12	Chemical Engineering Group. Joint meeting with the Bristol Section, with a visit to the works of the National Smelting Co., Ltd. "The Treatment of Flotation Concentrates Preparatory to Zinc Smelting." Stanley Robson.	Bristol.
12	Oil and Colour Chemists' Association : "Silicon Esters." George King. 7.30 p.m.	30, Russell Square, London.
13	Society of Chemical Industry (South Wales Section) : "Further Notes on Pure Chemicals." E. A. Tyler.	Thomas's Café, High Street, Swansea.
13	Institute of Chemistry (London Section) : S. M. Gluckstein Memorial Lecture. Dr. L. H. Lampitt.	London.
13	Oil and Colour Chemists' Association (Manchester Section) : "Fastness to Light." Dr. Stern. "Some Aspects of Colour Testing." C. D. O. Winslade. 7 p.m.	Milton Hall, Deansgate, Manchester.
13	National Smoke Abatement Society : "General Aspects of the Smoke Problem." Arnold Marsh.	College of Technology, Manchester.
13	Institute of Metals (Sheffield Section) : "Physical Testing." Professor F. C. Lea. 7.30 p.m.	University, Sheffield.

Wood Preservation: Aims of the New Association

By Sir Harold Boulton

At a representative meeting in London on Tuesday it was decided to establish a Wood Preserving Association. The aims of the new Association were so clearly set out by Sir Harold Boulton (of Burt, Boulton and Haywood, Ltd.), who represented the Association of British Chemical Manufacturers, that we reproduce his opening address.

IT is my duty to explain as briefly as possible the events which led up to the invitations to this meeting being issued by Sir James Calder and myself. A sub-committee of the Association of Tar Distillers, who are the producers of creosote, was formed to consider their joint interests in this product. Having started from a purely industrial standpoint, their deliberations very soon led them to the conclusion that the whole subject of wood preservation embraces a far wider area and raises far wider issues than merely the trade interests of a certain section of the community, and they thought that public and national interests as well as industrial interests would be served by forming an Association, the scope of which will be best illustrated by my giving a list of the various elements whom we have endeavoured to get represented at this meeting.

Interests Represented

The national importance of the preservation of our now scanty forests has been considered in the invitation issued to the Government Departments concerned, to prominent landowners and farmers, and to arboriculturists identified with the subject of the conservation of forests. We have invited representatives of the great railway companies, who now creosote most of their own material; the Admiralty, and others interested in the preservation of marine timbers; representatives of the General Post Office, who have been steady supporters of creosoting for many years and who have followed the scientific development of its application with the greatest attention and with very brilliant results. We have also included representatives of the coal tar industry, from whom the germ of our present ideas originally sprang, and naturally as many members of the wood-preserving industry itself as we could get together. The Association of British Chemical Manufacturers have asked me to represent them officially on this occasion. It seemed of paramount importance that the engineering profession should be represented, and I am glad to know that the Institute of Civil Engineers, who have always taken the lead in this matter of wood preservation, are represented here to-day. The Timber Trades Federation of the United Kingdom would naturally be deeply interested in such a matter and they also are represented. The importance of the matter to builders, surveyors, and architects has also not been lost sight of.

Objects and Methods

What we aim at can best be described by a summary of the objects, and the means of obtaining them, of the proposed Association, which are as follows:—

The objects of the Association shall be:—(a) to spread knowledge of wood-preservation with a view to prevention of wastage of timber, and to standardise specifications for wood preservatives and their application; (b) to investigate all possible methods of wood preservation; (c) to afford members opportunities for the interchange of ideas regarding improvements in wood-preservation, and for the discussion of all matters bearing thereon.

The means suggested for the above purposes are:—(a) the holding of meetings in various places for the reading of papers and reports and the discussions thereof; (b) co-operation and affiliation, where thought necessary, with all organisations, official or other, connected with forestry or timber or any subject cognate to the objects of the Association; (c) the promotion of the use of treated wood; (d) the publication of a journal and pamphlets from time to time containing desirable information, and the formation of a library regarding wood-preservation; (e) the carrying out and promotion of research work in the practical field, in connection with wood-preservation; (f) such other measures as may be thought desirable.

I must emphasise the fact that the scope of the proposed association would include not merely creosoting, but dissemination of a knowledge of any sort of wood preservative, past, present or future, which may have its own particular uses for particular purposes. Such an association will eschew all mysteries in connection with the substances or methods used for wood preservation, and bring to common knowledge, after due exposition and discussion, any process which will be for the benefit both of the industrialists concerned and of the community in general.

A Reminiscence

If you will forgive a personal explanation, I will explain why I was emboldened to put my name to this invitation. It is more than ninety years since, in 1838, Mr. Bethell brought out his first creosoting patent. Those I am connected with succeeded to this business. I am commercially descended from those who entered into partnership with him in 1850. In 1853 our then senior partner, Mr. Burt, being a member of the Institution of Civil Engineers, read a paper on wood preservation to that body; in 1884 the then senior partner, Mr. S. B. Boulton, read another paper, for which he received the Telford Gold Medal. I was present at the reading of the paper and the two evenings' discussion which followed. So that ourselves and others in the creosoting trade have always, as is natural, remembered that the subject is an engineering and chemical one as well as an industrial one; and finally, only twenty years ago, it fell to my lot personally to persuade the great Canadian railway companies to put a stop to the appalling waste of their great natural resources in timber, by seriously taking up creosoting.

Incidentally, the experiences gained in Canada have been the cause of certain modifications in specifications of the preservatives used there and certain modifications in the processes and in the kinds of timbers used; certain hardwoods, which had not formerly been considered fit subjects for creosoting, have been found useful, and with regard to a particular soft wood—Douglas fir—new methods of treating it have been found. This from an Empire point of view is desirable, because in certain circumstances it can be substituted for the Baltic timber which has hitherto formed such a large proportion of the material used by our railways.

The Example of America

Finally, I wish to say that the experience gained from the American Wood Preservers' Association, in which Canada is also included, has been a great help both to Sir James Calder, who also has Canadian experience, and myself, in formulating our ideas for the proposed association. In transplanting the ideas to our own soil, we are hoping to extend its limits beyond that of a merely trade association in the ways I have outlined, and we who have been engaged so long in wood preserving by creosoting and various other methods are able to put at the disposal of the new association about a century of practical work and scientific research and record.

Chemical Engineering Group

Joint Meeting with the Bristol Section

THE next meeting of the Chemical Engineering Group of the Society of Chemical Industry will be held at Bristol jointly with the Bristol Section of the Society on Thursday, December 12. At 2.30 p.m. there will be a visit to the Avonmouth Factory of the National Smelting Co., Ltd., by the kind invitation of the directors, who will also provide tea for the visitors. Transport to and from Avonmouth will be arranged. At 6.30 p.m. there will be a meeting in the Chemical Department of Bristol University. A paper entitled "The Treatment of Flotation Concentrates Preparatory to Zinc Smelting," will be read by Mr. Stanley Robson, M.Sc., D.I.C., M.I.Chem.E., chairman of the Bristol Section and a member of the Group Committee. The paper will deal with the physical conditions of flotation concentrates; problems in the handling and transport of finely-divided ores; roasting and smelting of such materials; method of cleaning dust-laden roaster gas and of manufacturing sulphuric acid therefrom. At 8.30 there will be an informal dinner at Hort's Restaurant, Broad Street, Bristol.

The Dyestuffs Patent Action: Hearing Continued

Evidence of Dr. Oberlander

Below appears an account of the further hearing of the I.C.I.—I.G. patent action. Reports of the earlier proceedings appeared in THE CHEMICAL AGE *of November 23 and 30.*

ON Thursday, November 28, Dr. Oberlander was further cross-examined. He said considerable use was made of dyes that were not fast to light, particularly for such articles as ladies' evening dresses. The commercial standard of fastness had been increasing since 1913. Witness agreed that in the prior American patent of the respondents, one could "criss-cross" as much as one liked in the couplings.

His lordship: I take it the American patent is an elaboration of the English patent?

Mr. Cripps agreed that that was so.

Witness said that in his opinion the respondents' patents had not been anticipated by any prior publication.

On Friday, November 29, Dr. Oberlander, in reply to further questions, said he had tested the dyes with a view to commercial use.

Mr. Cripps said his clients had tested more couplings than were in the particulars of objection, and had some good results and some bad ones. Amongst couplings tested were Fast Red R, Fast Red KB, Fast Red TR, Fast Scarlet TR, Fast Orange G, Fast Yellow G, Fast Scarlet GG, Fast Red BB, Fast Blue B, and Fast Red RB. They gave these a fair test, and some did not work. Counsel asked if the above was a fair selection of diazo dyes.

Dr. Oberlander: Yes.

It was mentioned that the respondents had cut out the nitro group in their amendment, as some of the group did not work.

Matching of Colours

On Monday morning, when the hearing was resumed, Mr. Watson informed his Lordship that the daylight was sufficiently good to enable the matching of colours to be carried out by the experts. That being so, they were so engaged that morning, and he asked that the Court should not sit till two o'clock.

His Lordship asked if the parties were sure that the light had not got so bad in the last half hour as to stop it. (In court the electric light had to be switched on.)

Mr. Watson said he was told that the light was good enough and that the matching was taking place at Dr. Oberlander's laboratory near the Mansion House, in the City. His clients' experts had been spending the week-end in getting out colour cards to compare with the petitioners' cards.

His Lordship assented, saying that the work would save a great deal of the Court's time.

In the afternoon, Dr. Oberlander was further cross-examined.

Mr. Cripps asked Dr. Oberlander if he had looked through the book containing the ten tests made with azo-dyes by the petitioners and their classification by the petitioners. If he had, what were his views?

Dr. Oberlander: The classification adopted is an entirely arbitrary one.

Mr. Cripps: All gradings and classifications are arbitrary.

Dr. Oberlander said that in many respects he did not agree with the classifications.

Mr. Trevor Watson said he wished to understand that there was no definite standard for the intermediate classes.

Mr. Cripps said he agreed with that. He then cited to witness statements made in a book produced by the predecessors of the I.G. giving details of discharges.

Witness agreed with the statement made there in regard to white. He did not conform with all the tests there laid down. A good discharge was pure white.

Fastness

On Tuesday, Dr. Oberlander's cross-examination was continued on the point of fastness.

His lordship pointed out that Professor Rowe (the petitioners' expert) had had put before him a card, and he had put the fastness at one and Dr. Oberlander and Dr. Goldsmith had given it as 164. They were both dealing with the same colour and the same dye.

Mr. Cripps agreed that it was the same dye, but the couplings were different. It was impossible and a waste of time, said counsel, to go through all the tests. He would therefore choose card 6 as to the fastness of a scarlet dye on a series of hanks.

Dr. Oberlander was of opinion that hanks 1, 2, 4, 5, and 7 stood up to kier boiling, but hanks 3 and 6 were attacked by boiling. He was sure that hank 5 stood up to kier boiling. There was a good deal of colour in hank 6.

Mr. Cripps: I ask you if it is commercially useful?

Dr. Oberlander: It is not bad.

Mr. Cripps asked why witness had taken Fast Orange G for fastness to kier boiling.

Dr. Oberlander: It is a combination of dyes 379 of the 1912 publication.

Mr. Cripps next passed to the particulars of Dr. Oberlander's discharges and the quality of those discharges. He asked whether, of the eight Dr. Oberlander took, five were specifically dealt with in the I.G. books.

Dr. Oberlander: I did not know that. I make my own experiments and give the results.

Mr. Cripps: It is a curious coincidence that five of them are dealt with in the I.G. books.

Dr. Oberlander: Perhaps it is a coincidence. I have never seen the book or followed the book.

Question of Classification

On Wednesday, Dr. Oberlander was questioned by Mr. Cripps as to the comparison of the results of dyes. Counsel said 20 unselected dyes were taken, and of these the petitioners' results agreed with 14 of the respondents', and in six instances Dr. Oberlander's classifications were higher than petitioners, and in no instance was it lower.

Dr. Oberlander said that was so.

Mr. Cripps: There are 40 selected dyes from the three patents, and in 10 instances we agree.

Dr. Oberlander assented.

Mr. Cripps: There are 25 classified higher than ours, and a small variation in the classification of two or three others.

Dr. Oberlander: That is so.

Mr. Cripps: I put it to you that in every case you are practically higher in classification than we are?

Dr. Oberlander: Yes.

Mr. Cripps: Taking yellow and orange and red and green, there are 14 cases in which you make other alterations?

Dr. Oberlander: Yes.

Mr. Cripps: So that on the whole your classification is higher than ours in the selected and unselected dyes?

Dr. Oberlander: Yes. We applied the same standard.

Mr. Cripps: But you have considerably increased our grading in two cases.

Dr. Oberlander: Yes.

Mr. Cripps: And they were nitro cases?

Dr. Oberlander: Yes.

On Thursday, his lordship said that as there were going to be commercial witnesses on either side, it would be almost impossible, within a reasonable time, to give evidence on each one of these tests. He was anxious to save time by curtailing some of the evidence, and he suggested that he and Professor Smithells, his assessor, should make a selection of seven tests, which would give them rather a good indication of the differences between the parties. This suggestion was accepted by counsel on both sides.

Dr. Oberlander was further cross-examined as to the tests he had made with the respondents' dyes, and he maintained that they were fast to kier boiling, with good shades and fastness to light. They could not alter the resistance of a dye to kier boiling. All the dyes in the tests were diazo compounds, and gave good results.

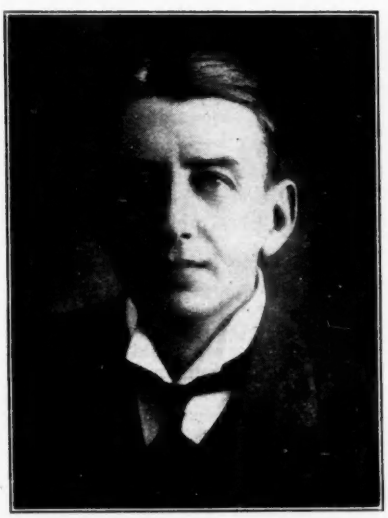
So far, the case has occupied the attention of the Court for eleven days. Dr. Oberlander has been in the witness box for seven days, and at the time of going to press is still under cross-examination.

Samuel Rideal: An Appreciation

SAMUEL RIDEAL was educated at Dulwich College, the Royal School of Mines, and University College, London. He remained at University College, after graduating, first as Williamson's and then as Ramsay's assistant. Afterwards he went, for a few years, as lecturer in chemistry at St. George's Medical School, before commencing his consulting practice at 28, Victoria Street, Westminster, which he built up and maintained an active interest in for thirty-five years. During the whole of this time he was Public Analyst for the Metropolitan Borough of Chelsea, and for a short time Public Analyst for Lewisham.

Interest in the Social Services

At a very early stage in his career he became interested in the various phases of Local Government, and, as a chemist, observed the necessity for some type of scientific control of such social services as sanitation, water supply and sewage purification. As a result, his laboratory became, not so much a consultant's analytical laboratory as one in which original investigations played, if not in all cases a major, at least an important part in any work that was undertaken.



THE LATE DR. SAMUEL RIDEAL.

He was an active member of the Society of Public Analysts, and sometime President; on several occasions a member of the council of the Institute of Chemistry; and his name is associated with many and varied standard analytical methods, such as the determination of amino-groups by the method of Rideal and Green; dissolved oxygen by the method of Rideal and Stewart, and the standardisation of disinfectants by the Rideal-Walker method. Beyond this, however, his scientific investigations had a great influence on the design of modern plants for water and sewage purification, including the employment of sterilising agents such as ozone and chlorine, and many of these plants operating for the public good can be considered worthy memorials to him. He was the author of numerous contributions to scientific literature, and papers will be found by him in the *Journal of the Chemical Society*, the *Journal of the Society of Chemical Industry*, the *Analyst*, etc. His published books dealt with water, sewage, disinfection, and glue, and he was general editor of Rideal's *Industrial Chemistry*. He gave evidence at a number of Government inquiries on subjects upon which he had become an acknowledged authority, such as the Royal Commission on Sewage Disposal. He was well known as an expert witness in the Courts, and gave evidence in a large number of Parliamentary inquiries into water and sewage bills.

His direct methods were appreciated by his staff, two of whom, Stewart and Orchard, were with him all their lives. Their affection for him knew no bounds, and it was no uncommon thing to find one or the other spending the week-end in the laboratory with him, when any pressing work was on hand.

His scientific interests ranged outside that of a consultant on sanitation, for he was one of the first to realise that whilst synthetic indigo had almost ousted the natural product, the same state of affairs was not likely to be the case with rubber, provided that systematic planting and tapping of rubber trees was carried out. Eight or ten of the smaller companies in which he became interested as director or chairman proved to be exceptionally successful. By political persuasion he was a Liberal, and an active member of the National Liberal Club. Just before the war he was prospective Liberal candidate for Salisbury, but owing to the outbreak of war he did not actually stand. He was, however, never at home in the rôle of politician.

In common with many professional Liberals, he had a great appreciation of and respect for German scientific methods; and the outbreak of war, together with the participation of one son in the Army and one in the Navy, and in war duties by his wife and himself, together with the temporary collapse of a number of business interests following on the cessation of war, so affected him that he lost much of his vigour and strength, which never returned to him, even though more time than ever was spent on his favourite pastime of gardening. After 1921 he no longer took an active part in the practice, which was carried on by his son, Dr. Eric K. Rideal. In 1924, Mr. A. Sciver joined the practice, which will be carried on by Dr. Eric Rideal and Mr. A. Sciver in partnership.

A. SCIVER.

Deaths on Wrecked Liner

Theory of Hydrogen Sulphide Poisoning

POISONING by sulphuretted hydrogen was stated, at the inquest at Queenstown on Saturday, November 30, to have been responsible for the disaster on the wrecked liner *Celtic*, on Friday, November 29, in which three men were killed and sixteen incapacitated. A fourth man died in hospital next morning. The men were breaking up the *Celtic*, which ran on to the rocks at the entrance to Cork Harbour last December. Two of them collapsed while working in a hold containing grain, and the others were affected by the gas when going to their assistance.

Dr. J. J. O'Connor, port medical officer, said that he based his opinion that sulphuretted hydrogen was the cause of the deaths on the symptoms shown by one of the men before his death. They were quite different from the symptoms of carbon monoxide poisoning. Questioned by the coroner, Dr. O'Connor said that the gas could be formed from decaying matter, although it was essential that the matter should be in contact with something else.

Mr. J. Kavanagh, on behalf of Messrs. Peterson and Halbeck, the salvage contractors, said that the occurrence was absolutely unforeseen and unavoidable as far as they were concerned.

The inquest was adjourned.

Murex Acquisition

THE directors of Murex announce that the negotiations referred to by the chairman at the last annual meeting have now been successfully concluded. The company will acquire from Imperial Chemical Industries 91·77 per cent. of the issued capital of Premier Electric Welding Co., which company in turn holds 75 per cent. of the issued share capital of a subsidiary welding company. The purchase price will be satisfied by the issue of fully-paid shares in Murex. This arrangement is in pursuance of the policy of combining, under the control of Murex, welding and other associated businesses, which was initiated by the recent transfer of the Thermit organisation to Murex. Since the date of the last balance sheet of Murex, the board add, the business of the company has continued to expand, with the result that the profit on the trading operations shows a satisfactory increase over the corresponding period of last year.

Printing Inks

Their History and Development

Dr. J. J. Fox (president) was in the chair at a meeting of the Oil and Colour Chemists' Association, held on Thursday, November 28, at the Institute of Chemistry, London, when a paper was read by Mr. T. Hedley Barry on "The Development of Printing Processes and Printing Ink."

Mr. T. Hedley Barry said that there did not seem to be very much information about the origin of printing ink. In the year 1683, Joseph Moxon, the Royal Hydrographer, published a book called *Mechanic Exercises*, which was really intended to cover every kind of mechanical device. It was published in two volumes, the second of which was devoted almost entirely to printing.

In this book it was stated that the bad condition of printing at the time was due largely to the fact that printers were too lazy to make their own inks, probably because it was "as noisome to the senses as it was laborious to the body." According to this writer, the printing ink maker in those days did not refine his oil, and did not put enough black in. He would use "train oil," and put in too much rosin, and, therefore, nothing could be expected but bad printing.

Dutch Manufacture of Printing Ink

Moxon pointed out that these things were done much better abroad, and referred to the manner in which the Dutch made printing ink. Apparently the Dutch method was to take linseed oil and heat it up and ignite it, repeating the process until it was sufficiently thick. The thickness mentioned was the "thickness of strong turpentine," and the amount of rosin added was ½ lb. to 1 lb. for every gallon of oil. Rosin seemed to have been considered an essential ingredient right up to comparatively modern times, and all the old recipes included it to some extent.

A rather interesting point in this book was the reference to firing the oil. It was pointed out that the preparation of the oil took very much longer if the oil was not fired. The reason was probably that in those days there were no thermometers, and consequently they either had to fire the oil intentionally, or they were so afraid of doing it accidently that they kept it far below ignition point and thus took a long time.

Another matter mentioned in this book was the use of "litharge of silver," which he imagined was silver oxide, and this was probably the first mention of silver as a dryer.

The Work of Baskerville

Apart from Moxon's book there was very little published information about printing ink until the eighteenth century, when the work of Caslon and Baskerville led to a revival of interest in good printing. Although Baskerville was chiefly famous for his work as a type engraver, he was also interested in the manufacture of printing ink, and the excellence of his work, apart from the artistic qualities of his type, was attributed to the quality of his inks. This is probably true to some extent, though his special process of pressing the printed sheets between hot copper plates immediately they left the press had something to do with it.

Baskerville appeared to have communicated his ideas on printing ink to William Bulwer, at that time connected with the Shakespeare Press, who finally enlisted the aid of Grafton and Martin. These two eventually opened a factory at Birmingham, and made black by "condensing the smoke in glazed earthenware vessels." Apart from this, the usual method of preparing black was to burn oils under a tent-like structure, and when the burning was over collect the soot from the sides of the tent. This method was in use when Blackwell opened the first printing ink factory in London, at Chiswell Street, in 1754.

Apparently the black was merely stirred into the oil by hand, so that it was still necessary for the printer to rub it out. Sometimes the black was stirred into the hot oil to save the labour of mixing it with the thick cold oil. Attempts were made to avoid the use of linseed oil altogether, notably by Baskerville, who suggested a formula including copaiba balsam and rosin as the chief ingredient.

Mr. Barry also summarised the early historical side of printing, and traced its development from China across the world from east to west, and its introduction and subsequent development in this country. He dealt with printing processes, as well as printing machines, illustrations being shown of both the earliest and most modern types of the latter.

Mr. A. O. Newman, commenting on the reference in the paper to the production of black in tents, said he did not know how the early makers prevented these tents from burning down. There was one ink maker in the early days who believed in beginning work early. He used to start at five o'clock in the morning from his house in Hornsey, and as it was his practice to knock the black down himself he certainly must have wanted a bath before he went home at night. The demands of the printers in the matter of ink now were very different from what they were even only five or six years ago; great strides were being made, and, of course, everybody hoped that this state of affairs would continue.

Mr. F. J. Tritton said that although there had been considerable development in the actual methods of manufacturing ink, the ingredients had not changed to any great extent. Since the early days of printing and the introduction of high-speed machine printing there must have been considerable development. The consistency of the inks must be decidedly different now from that required in the days of the hand press, and he imagined that in the near future even greater changes in the general type of ink required for printing would be experienced by the ink manufacturers. He was not suggesting in any way that ordinary letterpress printing was on the down grade, but it had probably reached the peak of its perfection.

Illustration Printing Process

Illustration printing processes were going ahead very rapidly, and he thought that probably the process of protogravure would eventually take the place of letterpress printing, and then the ink requirements would be very different from what they were to-day. Photogravure was being used for newspaper production in the form of supplements, and there were one or two weekly newspapers which appeared weekly with a photogravure supplement. Indeed, this had been going on for a good many years, and in America and Germany gravure supplements were quite common. In this country, in the next few years, he foresaw great improvements in photogravure printing, and it was quite likely that we should have daily newspapers in which the text and the illustrations were printed by the same process at the same time, probably in more than one colour.

The inks for that type of printing would necessarily tend to be of the volatile type, with a volatile organic solvent rather than a linseed oil base. We had got nearer to the use of that type of ink by the introduction of the ink pump on the Hoe machine, and if that were introduced on other types of machine, as he believed it would be in the near future, it would greatly simplify the use of volatile ink, and, with suitable modifications, very greatly improve the inking methods which were at present in use, and which certainly used to be rather crude.

Mr. Barry, replying to the discussion, said that the photogravure process to which Mr. Tritton had referred was a typical case of a process which could not be adopted for high speed work without first-class rotary machines. Although the photogravure process had made great developments in recent years it was by no means the only process available, and it had its limitations. Reference had been made by Mr. Tritton also to the extension of photogravure supplements in American newspapers. The position there appeared to be that a few large houses provided supplements for numbers of local newspapers, and that indicated the limitation of the process as well as the application of it. With regard to inks for it, it was difficult for him to mention them in his paper. Being a new process, the printing ink makers were rather quiet with regard to the technique of its manufacture, and in his capacity as consulting chemist he did not think he should discuss the matter at the moment.

Annual Meeting of British Association of Chemists

Mr. Scholefield on Rationalisation

THE annual general meeting of the British Association of Chemists was held at the Manchester College of Technology, on Saturday, November 30, at 3 p.m., Mr. F. Scholefield, the president, being in the chair.

Mr. W. H. Woodcock, hon. treasurer, presented the accounts. He was glad to be able to report a small balance on the credit side. It was satisfactory to note that subscriptions had risen substantially, and that arrears had fallen. This was a satisfactory position. The position of the Unemployment Benefit Fund was very sound. The reserves had considerably increased during the past year, and the unemployment committee were to consider the increase of benefit. It was as yet uncertain if this would be practicable at present, but he would personally like to see the benefits increased at an early date. (Applause.)

Mr. Foster expressed the view that a reduction in unit subscription and an increase in benefit would be welcomed by members. He proposed a resolution requesting the Unemployment Special Purposes Committee to consider the question. The resolution was carried.

The Association and the Ministry of Labour

Mr. H. T. F. Rhodes, in submitting the annual report of the council, alluded to the increase of membership, which was larger than for many years past. The Unemployment Fund had paid out £504 in benefit during the year, but in spite of this heavy call on it, the fund was in a thoroughly satisfactory position. The importance of the collaboration of the Ministry of Labour with the Association could not be exaggerated. The Ministry recognised the Association as the appropriate body to deal with questions of the employment of chemists. (Applause). He expressed the hope that the Association's proposals in regard to the organisation of the profession would be considered strictly on their merits as a practical proposition.

Mr. J. R. Johnson proposed the election of the officers for the coming year as follows :—President, Mr. F. Scholefield ; vice-presidents, Sir Max Muspratt, Mr. W. E. Kay, Mr. C. S. Garland, Professor E. C. C. Baly, Mr. S. R. Price, Mr. J. B. P. Harrison ; registrar, Dr. E. H. Rodd ; treasurer, Mr. W. H. Woodcock ; editor, Mr. H. T. F. Rhodes.

The president paid a tribute to Mr. W. E. Kay, who had written apologising for his absence. Mr. Scholefield said Mr. Kay was well known in Manchester for his great ability as a chemist and for his sound judgment and experience. He was among the original members of the Association and he had worked untiringly in its interests. (Applause.)

The President's Address

In the course of his address, Mr. Scholefield drew attention to the increasing tendency in every direction to large-scale organisation in industry. It was an example that sooner or later the profession of chemistry would be obliged to follow : that was to say, to organise comprehensively on the lines of the professions of law and medicine. The position of the individual chemist was quite different from that occupied by him even twenty years ago. It had to be recognised that industrial changes involved a necessary development along the same lines in professional organisation. The professional group would have to deal with the industrial group.

The time was coming when the chemist would not have to consider which company he would enter, but how he was to enter the service of *the* company. Imperial Chemical Industries, Lever Bros. and the Margarine Trust were good examples of the trend of events. Amalgamation begun on these lines would not stop there. It was only the beginning of larger and larger associations and combines. This would mean the restriction in movement of the chemist, and a change in his value as an individual.

This was not necessarily a bad thing. There was no indication, rather the contrary, that large industrial organisations would use their power oppressively. But it had to be recognised that the position called for a similar rationalisation on the part of the professional worker, or he must undoubtedly, in the circumstances of the case, suffer injury. The object of such organisations was primarily, of course, as with the combines, economic. There were increased opportunities for the profession working as an organised unit which could not be grasped by individuals. The loss of those opportunities would be a very serious matter for the profession and for industry.

The Dinner

The annual dinner was held at the Queen's Hotel, Manchester, at 7 p.m., Mr. F. Scholefield presiding.

In proposing the toast of the Association, Professor G. T. Morgan commented upon the satisfactory position. The condition of the general fund and that of the Unemployment Fund showed that the Association was making good progress, and he was glad to note the satisfactory increase in membership. The work that the Association was doing in the direction indicated in the annual report proved that it merited the increased support it was receiving. (Applause.)

Replying, Mr. W. H. Woodcock said that it was a very great pleasure to welcome Professor Morgan and to hear him, as a Past President, pay so handsome a tribute to the Association. Quite apart from the financial position, progress had been considerable. Professor Morgan had said something about what a tight hand he kept on the purse strings ; that was the unpleasant duty of all treasurers. With the balance sheet and a bloodthirsty annual meeting always in mind he gave everybody as much as he could, if not as much as they deserved.

Mr. H. T. F. Rhodes, editor of the *Chemical Practitioner*, proposed the toast of the guests. He said that the guests were invited because they were friends, and that friends were necessary to all organisations, professional or otherwise. In the name of the council he congratulated Dr. Levinstein on his election as president of the Society of Chemical Industry.

Principal B. Mouat Jones, replying, said that owing to the princely way in which he had been entertained it was with the greatest difficulty that he rose to his feet to reply to the toast at all. He had liked to regard himself as a chemist until he was found out, and at least he did know that they understood the good things of this world. He had eagerly accepted the Association's invitation with this knowledge in mind, and he thanked the Society on behalf of the guests for its welcome.

Dr. H. Levinstein said that it was a great pleasure to him, as a Past President of the Association, to note its steady advancement. In spite of the fact that progress was slow there was a movement to oganise the societies in such a way that the burden of subscriptions for the numerous chemical journals could be lightened. There was also the possibility that at least some of the societies would find a common headquarters in one building. These things would bring about closer co-operation among the societies, an end towards which all societies were working.

Smokeless Fuel

Lord Parmoor at Richmond Gas Works

LORD PARMOOR, Lord President of the Council, visited on Friday, November 15, the Richmond (Surrey) Gas Works to inspect the low temperature carbonisation plant of the Gas Light and Coke Co., which has been working satisfactorily since February, producing a smokeless fuel for domestic use. He was accompanied by Dr. F. E. Smith, secretary of the Department of Scientific and Industrial Research, and Dr. C. H. Lander, Director of Fuel Research to that Department, and on arrival he was received by Sir David Milne-Watson, the Governor of the Gas Light and Coke Co.

The plant, with 40 cast iron retorts, was erected as the result of a request made by the Government in 1927, to Sir David Milne-Watson, who was asked to examine all low temperature carbonisation processes of coal with a view to installing at the company's works the one he considered most suitable for a London gasworks. He selected a plant of the type developed at the Government Fuel Research Station at Greenwich. The object of the installation was to test under commercial conditions the economics of the process and the markets available for the smokeless fuel, tar oils, etc. Lord Parmoor was interested to hear that so far the experiment had been as satisfactory as was expected, though it will be some time yet before any definite conclusions are reached.

Chemistry and Plant Diseases

A Paper Read Before the Society of Chemical Industry

At the monthly meeting of the London Section of the Society of Chemical Industry, held at Burlington House, London, on Monday, Mr. H. Martin (Research Chemist at the South-Eastern Agricultural College) read a paper on "Chemistry and Certain Problems of Applied Mycology."

Mr. Martin pointed out that the applied mycologist, who was concerned with the control and prevention of plant diseases, was confronted by a host of problems to which he must turn to chemistry for a solution, problems which to the chemist were unique in their diversity and interest. Hitherto the economic importance of applied mycology had not generally been realised, and it was naturally difficult to arrive at an estimate of the loss caused by disease in crops, although it was extremely large. From the utilitarian point of view, applied mycology offered a field of profitable research, but co-operation with chemistry was essential for the successful evolution and adoption of the majority of control measures employed.

Fungicides

The most important application of chemistry in applied mycology to-day was the use of fungicides to prevent plant and crop disease, and the industrial chemist would, of course, be interested in the commercial possibilities of fungicides. The extent of the market for such products was illustrated by figures from the French wine-growing districts, where the utilisation of fungicides had reached a high pitch of perfection and had become part of the general routine. It was estimated that the annual consumption of copper sulphate used for fungicidal purposes in these districts amounted to 100,000 tons, having a value of £2,500,000.

By hit or miss methods, fairly satisfactory copper preparations had been evolved which fulfilled the obvious requirements of a fungicide—namely, that the spray should cause no injury to the plant but yet retain its toxicity towards the fungus. Copper sulphate itself would not only cause injury, but would fail as a protection because of its rapid removal by rain or dew, and these objections had been overcome by the employment of the basic precipitates produced by adding certain alkalies to the copper sulphate solution. Millardet, for instance, employed lime for this purpose, and the Bordeaux mixture finally evolved from his and Gayon's trials was still the most popular of the copper-containing sprays. Ordinary washing soda had also been added, the resultant mixture being called soda, Bordeaux or Burgundy mixture.

Technical Details of Preparation

The preparation of these mixtures, however, was a troublesome process, and owing to the rapid loss of adhesive properties of the precipitate owing to crystallisation, it was advisable that the mixing should be done immediately before use. There was, therefore, an urgent demand for a substitute which by mere addition to the spray tank would obviate these difficulties. Attempts to produce such a product as, for example, the Borderite paste introduced by Pickering, the basic copper chloride recently re-introduced in Czechoslovakia, and certain copper-containing powders prepared by the interaction of copper sulphate with sulphonated residues of oil purification or with alkaline extracts of lignite, had met with but partial success.

In America, where the use of dusts as distinct from sprays had progressed remarkably in recent years, it had become usual to employ mixtures of mono-hydrated copper sulphate and hydrated lime. These so-called copper-lime dusts possessed many practical advantages, but had not proved as effective as ordinary Bordeaux mixture. It would therefore appear that the successful derivation of the desired substitute would only follow a more fundamental knowledge of the action of Bordeaux and Burgundy mixtures upon the parasite and plant.

An examination of the work done in the past upon the fungicidal properties of sulphur mixtures revealed, in certain aspects, a state of chaos from which a few important conclusions had emerged, but there was an almost complete ignorance of certain fundamental points. The problem was reduced to the consideration of the means whereby the action of the sulphur was brought about, and various hypotheses had been put forward suggesting that an oxidation process occurred before fungicidal action was possible. Directly opposed to this, however, was the discovery by Barker of the formation from sulphur, dusted on the leaves of certain plants, of a compound giving the reactions of hydrogen sulphide. This observation had been followed by the demonstration of the toxicity of hydrogen sulphide to fungus spores in general.

The Behaviour of Sulphur

At Wye, work had been concentrated more upon the fact that contact with the fungus seemed all-important, and, as the result of the study of the action of sulphur on copper, it was suggested that hydrolysis was concerned in its fungicidal action. If this hypothesis be accepted, it followed that a fungicidal sulphur compound was formed as the result of the hydrolysis. The mechanism of the reaction of sulphur with solutions of alkali and alkaline earth hydroxides was not fully known, but undoubtedly hydrogen sulphide was an initial product. The end products of the sulphur-alkali reaction were, on the other hand, well known, and the products obtained by the interaction of sulphur with alkaline hydroxides were standard fungicides.

Work just concluded seemed to establish that the fungicidal factor in these substances was sulphur in polysulphide form. By this was meant sulphur combined in sulphide form in excess of that required to form the normal sulphide. Work upon hops showed that the action of the solution upon mildew was determined solely by the content of polysulphide sulphur. There were theoretical reasons for believing that the protective fungicidal action of these spray materials was likewise governed by their content of polysulphide sulphur, but even if the practical demonstration of this probability be delayed, the work on hops was of obvious and immediate benefit, both to producer and consumer. The grower would always be certain of getting a satisfactory fungicide, and the chemist would know at what to aim in the manufacture of these products.

Chemical Merchants' Affairs

DAVID MISELL and Julian Misell, who traded as D. and J. Misell, chemical merchants, of 10, Rangoon Street, Crutched Friars, London, applied for their discharge from bankruptcy, on Friday, November 29, in the London Bankruptcy Court before Mr. Registrar Mellor.

The Official Receiver reported that the applicants failed in November, 1928; their total joint unsecured indebtedness was about £2,226, and their joint assets (estimated to produce £1,347) had produced £340. A dividend of 1s. 2d. in the £ was likely to be paid. In April, 1926, the applicant, David Misell, commenced business in partnership with his son Julian, the other applicant, as chemical merchants at Coopers Row, E.C., under the style of "D. and J. Misell." In May, 1927, they removed to 10, Rangoon Street, E.C. Their business was adversely affected by lack of sufficient working capital, and from the commencement they traded on borrowed money, and in September, 1928, following upon pressure, they called a meeting of their creditors and executed a deed of assignment to a trustee for their benefit. From May to September, 1928, they also carried on at 10, Rangoon Street, E.C., the business of selling an insecticide and weed killer under the trade mark "Vivus," which trade-mark, together with the formula for the insecticide, they had returned as an asset estimated at £1,000 in their statement of affairs. In March, 1928, the applicant Julian Misell ceased to take an active part in the firm's business. Their failure was attributed to lack of sufficient working capital, to their gross profits having been insufficient to meet their heavy overhead charges, *i.e.*, rent, wages, and the cost of advertising the "Vivus" weed-killer. The Official Receiver further reported that the applicants' assets were not of a value equal to 10s. in the £ on the amount of the unsecured indebtedness, and that they had continued trading after knowing themselves to be insolvent. Further, that D. Misell had on a previous occasion been adjudged bankrupt.

His Honour granted the discharge of the applicant, Julian Misell, subject to seven days' suspension, and the application of David Misell was adjourned until December 13, to enable him to satisfy the Court that he would be in a position to consent to judgment for a nominal sum in consideration for his immediate discharge.

Chemical Matters in Parliament

Morphine and Heroin Exports

SIR K. VAUGHAN-MORGAN asked the President of the Board of Trade (House of Commons, November 28) the amount and value of British-made morphine, morphine salts, and heroin exported each year from 1925 to 1928. Mr. Clynes stated that exports were as follows :—

	1925. ozs.	1926. ozs.	1927. ozs.	1928. ozs.
Morphine Alkaloid ..	2,185	455	265	174
Morphine Salts	82,110	63,433	58,138	38,812
Morphine and its salts contained in preparations	11,002	9,401	7,704	10,838
Heroin Alkaloid	516	273	519	353
Heroin Salts	7,728	6,470	10,576	5,582
Heroin and its salts contained in preparations	69	56	71	103

Full details as to the countries to which such exports were consigned were contained in the British Report to the League of Nations for the last two years.

Dyestuff Licences for November

THE following statement relating to applications for licences under the Dyestuffs (Import Regulation) Act, 1920, made during November, has been furnished to the Board of Trade by the Dyestuffs Advisory Licensing Committee :—

The total number of applications received during the month was 656, of which 536 were from merchants or importers. To these should be added two cases outstanding on October 31, making a total for the month of 658. These were dealt with as follows :—Granted, 635 (of which 628 were dealt with within 7 days of receipt) ; referred to British makers of similar products, 19 (of which 17 were dealt with within 7 days of receipt) ; outstanding on November 30, 4. Of the total of 658 applications received, 645 or 98 per cent. were dealt with within 7 days of receipt.

Coal Gas Suicides

Preventive Suggestions by Dr. Waldo

DR. WALDO, H.M. Senior Coroner for London, in holding two inquests on suicides recently, made some pointed remarks and suggestions with a view of prevention. He said that a strking increase in cases of suicide throughout Great Britain had occurred of late years, there being one and a half as many cases at the present time, after allowing for the increase in population, since 1856. The majority of cases heading the list were nowadays due to poisoning by carbon monoxide contained in coal gas. Next in point of frequency came drowning. The same order of frequency, for 1928, obtained in his jurisdictions in the City and Southwark, closely followed by " Lysol " poisoning.

The first of the two cases of suicide referred to by him was that of a man, who, after tasting " Lysol " from a bottle, burnt his lips, and, apparently not liking the taste, spat it out, and then proceeded to hang himself with the window-blind cord. The second case was that of a woman who placed her head on a pillow in a domestic gas oven, with the tap turned on, and so killed herself.

Dr. Waldo said he was of opinion that every possible practical means ought to be taken in the removal of opportunity given in the way of coal gas and other poisons to suicides, which poisons were also the cause of many accidental deaths.

With a view to prevention, Dr. Waldo made the two following suggestions :—(1) The mixing of some formalin with coal gas in order to make it unpleasant to the smell as well as to cause the eyes to water, with possible sneezing. Formalin, he said, unlike some other chemicals, would not cause dangerous corrosion of the gas pipes ; (2) The non-publication by the Press of the morbid details of letters left behind by suicides, which frequently led (in Dr. Waldo's 28 years' experience as a coroner), by means of imitation through suggestion, to similar cases of suicide, besides acting grievously on the minds of relatives.

John Benn Hostel Bazaar

BOUVERIE HOUSE, the Fleet Street headquarters of Benn Brothers, Ltd., and associated companies, was the scene on Friday evening, November 29, of a very successful bazaar held in aid of the funds of the John Benn Hostel, an institution established in the East End some years ago in memory of the late Sir John Benn, the founder of the firm. The bazaar, which was organised entirely by the staff and held after office hours, was opened by Lady Benn, who said it was an excellent idea that every business organisation should have some piece of social work in which all the members could take a personal interest. She believed that the Bouverie House bazaar was the first of the kind to be organised by a staff and held after office hours in a business house in the heart of the city. There were nine stalls in the reception hall, and numerous side-shows in various parts of the building. The public attended in large numbers, and the proceeds amounted to about £200. A photograph appears below.

From Week to Week

LORD BLEDISLOE has been appointed Governor-General of New Zealand, and has resigned from the board of Chemical and Wood Industries.

UNIVERSITY NEWS.—*Cambridge:* Dr. F. P. Bowden has been elected to a Research Fellowship in Physical Chemistry at Gonville and Caius College.

MR. JUSTICE BENNETT, in the Chancery Division on Monday, made an order for the compulsory winding-up of Waste Food Products, Ltd., on a petition by the company.

DRUG HOUSES OF AUSTRALIA is the name under which a company has been formed with a capital of £4,000,000, following on the fusion some time ago of Duerdin and Sainsbury, Ltd. and Felton, Grimwade and Co.

THE NATIONAL SMOKE ABATEMENT SOCIETY has just published the first number of its new journal, *Clean Air*, which is to be issued quarterly, price 1s., or 2s. 6d. per annum, post free. The address of the editorial office is 23, King Street, Manchester.

THE SOCIÉTÉ BELGE DE L'ELECTROCHIMIE, in the organisation of which the Ougrée-Marihaye, l'Air Liquide, the Société Belge de l'Azote, and the Centrale Electrique de Flandre were jointly concerned, will have an initial production of 80 tons of calcium cyanamide per day.

TWO HUNDRED KILOS OF IODINE are produced daily at the State laboratory at Salso Maggiore, near Milan (Italy), from spring waters rich in salt and iodine. This production covers domestic needs. Twenty-five cubic metres of water at 16° C. yield a kilo of pure iodine. Numerous cosmetics, etc. are also produced.

THE GOLDEN CENTRE MINES of New York is stated to have taken up an option on a large group of chromite deposits twenty miles west of Lake Nipigon and twenty-five miles south of Collins, on the Canadian National Railway line north of Port Arthur, Ontario, where several occurrences of good ore are understood to have been found in a big peridotile dyke. Drilling is to be carried on and the company hopes to be able to secure large quantities of chromite for sale in the United States.

THE FIRM OF E. MERCK, of Darmstadt, has formed a holding company in Zurich, with a capital of 3,000,000 Swiss francs, under the name Holding A.-G. für Merck-Unternehmungen. The capital is held entirely by the firm. Into this holding company will be brought all the German, European and overseas branches of E. Merck. This action has been taken as a result of the favourable financial conditions in Switzerland. The capital needs of the Darmstadt concern will be covered by the holding company.

"L. AND N." COAL DISTILLATION, in its second report, covering the year to March 31, states that the period has been devoted to perfecting, both mechanically and technically, the first full-scale "L. and N." unit to be erected in this country, which, it is hoped, will be in continuous commercial operation at an early date. Arrangements were completed during the year with Leicestershire (L. and N.) Coal Distillation, under which that company acquired the present plant and received an exclusive licence to work and use the "L. and N." process rights in the county of Leicester. Additional plants are being erected by the Leicestershire company at the Ashby site, and the construction of the first two of these is now proceeding.

THE SOVIET GOVERNMENT has appointed Tomsky to be chairman of the directorate of the Soviet Chemical State Industry, which is to be centralised, or "combined," under a scheme for the reorganisation of the Supreme Economic Council. Iron mining and smelting are similarly combined under Mezhlauk, who retains also his present post as vice-chairman of the Council; the tractor industry is combined under Ossinsky, and directors have been appointed for various other industries. The chairmen of the new combinations had to set up boards of directors and draft Statutes for ratification by the Supreme Economic Council before December 10. These formations resemble the so-called **Glavki**, which prevailed in the early stages of the Revolution, but which were abandoned in favour of Lenin's New Economic Policy.

THE BELGIAN COMPANY "Produits Chimiques de Tessenderloo" recently increased its capitalisation from 35,000,000 to 45,000,000 francs by the issue of new shares. The chief purpose of the increase is to provide funds for a new company to be formed by the Produits Chimiques de Tessenderloo and the French company, Société des Potasses d'Alsace. A plant will be erected in the Limburg region for the production of sulphate of potash and the principal derivatives. The Tessenderloo firm manufactures potassium compounds by an electrolytic process at its present plant, but is said to be unable to meet the demand, which accounts for the new enterprise. The Tessenderloo will have a 50 per cent. participation in the company and its alliance with the French group is considered advantageous both from the point of view of providing an independent source of raw materials and giving a wider market for the finished product.

A SULPHURIC ACID PLANT at Baku, with an annual capacity of 850 tons, has begun operating. A second plant will be erected in 1930.

MR. GILBERT VARLEY was elected a director of the Neuchatel Asphalte Co. at the adjourned general meeting on Thursday, November 28.

BERYLLIUM MINERALS in rich deposits have been discovered in South Africa by the Beryllium Co., Ltd., on the property of the company at Naqualand.

INDIAN PRODUCTION OF MORPHINE (including free base, hydrochloride, acetate, sulphate and tartrate), in pounds, is given as follows:—1923–4, 425; 1924–5, 155; 1925–6, 158; 1926–7, 142; and 1927–8, 165.

THE CHIEF PRODUCERS OF MERCURY, the Idria works of Italy and the Almaden works of Spain, have established at Lausanne a joint sales office, under the title "Mercureo-europaeo," which will handle about 90 per cent. of the world-production.

MR. W. WEDGWOOD, chemist at the Shipley Urban Council's gasworks, sustained injuries to his eyes in an explosion in the works laboratory on Friday, November 29. He was detained in the Bradford Eye and Ear Hospital, and is progressing favourably.

THE BRITISH OXYGEN CO., LTD., it is understood, has been investigating the commercial value of various schemes for the bulk transport of oxygen in the liquid form. As a result, the company has acquired the rights for the British Empire of the system evolved by the Société l'Air Liquide.

THE CONTRACT made between the Zinc Producers' Association Pty., Ltd., and the British Government, under which practically the whole of the output of zinc concentrates produced by Broken Hill mines has been disposed of, will expire on June 30, 1930. The question of realising to the best advantage zinc concentrates which will be produced at Broken Hill subsequently to the date mentioned is receiving the close attention of the Association.

RECENT WILLS INCLUDE:—Mr. Adolph Hoegger, of Wilmslow, Cheshire, chairman and joint managing director of the British Cotton and Wool Dyers' Association (net personalty, £17,929), £23,626. He directed that his body should be cremated and the ashes placed in a plain urn and buried in his son's garden at Altstettin, Zurich.

MR. G. M. GILLETT, M.P., Parliamentary Secretary to the Department of Overseas Trade, discussing the future of the British Industries Fair, informed the members of Birmingham Chamber of Commerce, at a luncheon on Tuesday, that he was appointing a committee to examine the present situation as regards the Fair, and to consider what means could be adopted to increase still further its utility to British Trade. Lord Chelmsford would be chairman.

AN INSTITUTE OF PAPER CHEMISTRY, a gradual school for the training of chemists for the pulp and paper industry, is to be established at Lawrence College, in the United States. The Institute of Paper Chemistry, organised by the college and financed by the paper industry of Wisconsin, fully 90 per cent. of the paper mills being represented, is the realisation of an ideal cherished by Henry M. Wriston, president of the college, ever since his connection with Lawrence College began.

DR. JOHN ARTHUR WILSON has resigned his position as chief chemist of the A. F. Gallun and Sons Corporation, of Milwaukee, Wisconsin, to become president of John Arthur Wilson, Inc., consulting chemists specialising in leather manufacture, sewage disposal, and industrial problems, with headquarters at 441, Broadway, Milwaukee, Wisconsin. Dr. Wilson is president of the American Leather Chemists' Association, and author of *The Chemistry of Leather Manufacture*, one of the publications of the American Chemical Society Monograph Series.

PRICE, STUTFIELD AND CO., LTD., of 6, Fenchurch Buildings, London, announce that they have been appointed sole representatives for Great Britain and the Colonies for the activated charcoals and solvent recovery process "Acticarbone" of Société de Recherches et d'Exploitations Pétrolifères, of Paris. The processes for the manufacture of the charcoals and for solvent recovery are patented in Great Britain and elsewhere. The Société de Recherches et d'Exploitations Pétrolifères manufactures its activated charcoal in France. The "Acticarbone" process is applicable to the recovery of solvent vapours in all industrial processes, to the extraction of benzol from coal gas, petrol from oil gas, etc., and the company has erected a large number of plants in France, Belgium, Italy and elsewhere.

Obituary

MR. EDWARD SWANN, managing director of the British Recovered Rubber and Chemical Co., Ltd., on November 22. He was formerly associated for many years with the Anchor Chemical Co., Ltd., and later with Alfred Smith, Ltd.

MR. G. B. FRANCIS, formerly a director of British Drug Houses, Ltd., who was an original member of the Society of Chemical Industry and for many years an honorary auditor of the Pharmaceutical Society, on November 6, aged seventy-nine years.

References to Current Literature

British

ANALYSIS.—Quantitative chemical analysis by X-rays and its application. G. Hevesy. *Nature*, November 30, pp. 841–843.

ELECTROCHEMISTRY.—Some new aspects of the electrochemical oxidation of organic and inorganic compounds. IV.—Kolbe's synthesis of the hydrocarbons. V.—The action of fluorine on inorganic and organic compounds. F. Fichter. *J.S.C.I.*, November 29, pp. 347–354 T, 354–357 T.

OILS, ESSENTIAL.—The essential oil of silver pine (*Dacrydium colensoi*). W. J. Blackie. *J.S.C.I.*, November 29, pp. 357–358 T.

ORGANIC.—Combustion of acetylene. W. A. Bone. *Nature*, November 30, pp. 839–840.

POWER ALCOHOL.—Power alcohol production in Australia: The Shellkol product. *Chemical Engineering and Mining Review* (Australia), October 5, pp. 11–14. Describes the production of alcohol from molasses by fermentation at Sarina, Australia, by the Australian National Power Alcohol Co. (which is associated with the Distillers Co., Ltd.). The product is mixed with motor spirit and distributed under the name Shellkol.

United States

APPARATUS.—A modified van Slyke amino nitrogen apparatus. F. C. Koch. *Journal Biol. Chem.*, November, pp. 601–603.

GASES.—Explosive limits of industrial gases. J. Yeaw. *Ind. Eng. Chem.*, November, pp. 1030–1033.

GENERAL.—Some considerations in the electrothermal production of phosphoric acid. B. G. Klugh. *Chem. Met. Eng.*, November, pp. 666–669.

Alumina production in its present-day aspects. J. D. Edwards and R. B. Mason. *Chem. Met. Eng.*, November, pp. 674–677.

Solvent extraction obviates waste in acetic acid production. N. W. Krase. *Chem. Met. Eng.*, November, pp. 657–659.

Variation of surface tensions of lubricating oils with temperature. G. Winchester and R. K. Reber. *Ind. Eng. Chem.*, November, pp. 1093–1096.

Reduction of tricalcium phosphate by carbon: Effect of silica and alumina on the reaction. K. D. Jacob, D. S. Reynolds, and W. L. Hill. *Ind. Eng. Chem.*, November, pp. 1126–1132. Silica has a marked effect in increasing the rate of reduction of tricalcium phosphate by carbon. In its presence volatilisation of phosphorus begins at 1050° C., and under favourable conditions the reaction is more than 90 per cent. complete in 1 hour at 1250° C., or in 10 minutes at 1350° C. Alumina also accelerates reduction of tricalcium phosphate, but its effect is not so pronounced as that of silica.

HYDROGENATION.—Competitive hydrogenation. H. Adkins, F. F. Diwoky and A. E. Broderick. *J. Amer. Chem. Soc.*, November, pp. 3418–3423. An investigation of the factors determining the distribution of hydrogen by platinum between two competing reactants.

Some reactions of atomic hydrogen. H. C. Urey and G. I. Lavin. *J. Amer. Chem. Soc.*, November, pp. 3286–3290. Atomic hydrogen (prepared by Wood's method) acts towards organic compounds as a mild reducing agent.

ORGANIC.—Note on the preparation of the monoamino acids from their picrates. G. J. Cox and Harriet King. *Journal Biol. Chem.*, November, pp. 533–534.

Action of sulphuric acid on mercaptans. S. F. Birch and W. S. Norris. *Ind. Eng. Chem.*, November, pp. 1087–1090.

Composition of paraffin wax. S. W. Ferris, H. C. Cowles, Jr., and L. M. Henderson. *Ind. Eng. Chem.*, November, pp. 1090–1092. Evidence is presented warranting the conclusion that petroleum wax contains, in addition to straight-chain saturated hydrocarbons, a number of other types of hydrocarbons which are probably branch-chain paraffins rather than unsaturated or cyclic compounds.

VITAMINS.—The preparation and properties of vitamin C concentrates from lemon juice. D. P. Grettie and C. J. King. *Journal Biol. Chem.*, November, pp. 771–776.

German

ANALYSIS.—A new gravimetric method for the determination of barium and sulphate ions. R. Strebinger and L. v. Zombory. *Zeitschrift analytische Chem.*, Vol. 79, Parts 1–2, pp. 1–8.

The iodimetric determination of ferric salts, copper salts, and mixtures of both. F. L. Hahn and H. Clos. *Zeitschrift angewandte Chem.*, Vol. 79, Parts 1–2, pp. 27–37.

An investigation of the determination of copper according to H. Nissenson and B. Neumann. J. Madjel. *Zeitschrift analytische Chem.*, Vol. 79, Parts 1–2, pp. 38–44.

APPARATUS.—Electrodeburette: A simplified reference burette for potentiometric titrations. W. Ackermann. *Zeitschrift analytische Chem.*, Vol. 79, Parts 1–2, pp. 8–10.

A simple apparatus for micro-sublimation *in vacuo*. M. Wagenaar. *Zeitschrift analytische Chem.*, Vol. 79, Parts 1–2, pp. 44–46.

A new instrument for colorimetric analysis. F. Anselm. *Chemische Fabrik*, November 27, pp. 504–505.

An accurate Cochius viscometer. H. J. Schulz. *Chemische Fabrik*, November 20, p. 497. The difficulty of constructing accurate glass viscometers is avoided, in the Cochius viscometer described, by the use of precision glass tubes.

ADSORPTION.—Adsorption phenomena of the platinum metals. A. Gutbier and W. Schieferdecker. *Zeitschrift analytische Chem.*, Vol. 184, Part 4, pp. 305–332.

The adsorption of oxygen and ozone on silicic acid gel. A. Magnus and K. Grähling. *Zeitschrift physikalische Chem., A.* Vol. 145, Part 1, pp. 27–47.

CEMENT AND CONCRETE.—The setting and hardening of Portland cement under the influence of water-soluble admixtures: A contribution to the question of hydraulic hardening. H. W. Gonell. *Zeitschrift angewandte Chem.*, November 23, pp. 1087–1091.

The structure and resistance to chemical influences of concrete. R. Grün. *Zeitschrift angewandte Chem.*, November 16, pp. 1070–1074.

CHEMICAL ENGINEERING.—Recent methods of heating chemical plant. A. Ernst. *Chemische Fabrik*, November 20, pp. 495–497. The usual heating methods for chemical and related plant are first described—direct firing, coils, screwed-on jackets, etc.—and the advantages and disadvantages of each discussed. There is also mentioned a new method designed by R. Samesreuther and Co. and the I.G. Farbenindustrie A.-G., which permits the heating of vessels of all types to the highest possible temperatures, with good passage of heat, without making claims on the plant parts in respect of strength.

GENERAL.—The processes occurring in ageing thiosulphate solutions. F. L. Hahn and H. Clos. *Zeitschrift analytische Chem.*, Vol. 79, pp. 11–26.

The measurement of vacuum in chemical works. I. Möller. *Chemische Fabrik*, November 27, pp. 503–504.

The reaction in the Hargreaves process. B. Neumann and H. Kunz. *Zeitschrift angewandte Chem.*, November 23, pp. 1085–1087.

The oxidation of ammonium sulphite to ammonium sulphate by air in the presence of inorganic salts. D. Vorländer and A. Lainau. *Journal praktische Chem.*, Vol. 123, Parts 10–12, pp. 351–376.

Cadmium oleate: A new impregnation medium. H. J. Braun. *Chemiker-Zeitung*, November 27, pp. 913–914.

GLASS.—The increase in density of glasses on solidification under increased pressure and the reversion to the natural density on increase of temperature. G. Tammann and E. Jenckel. *Zeitschrift analytische Chem.*, Vol. 184, Part 4, pp. 416–420.

ORGANIC.—The condensation of hippuric acid with aldehydes: A new reaction for the detection of aldehydes. W. M. Rodionow and A. J. Korolew. *Zeitschrift angewandte Chem.*, November 23, pp. 1091–1092.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

320,182. Calcium Hypochlorite, Manufacture of. L. Mellersh-Jackson, London. From The Mathieson Alkali Works, 250, Park Avenue, New York. Application date, August 18, 1928.

The object is to obtain calcium hypochlorite of high purity. The hypochlorite formed by the chlorination of a slurry of lime is salted out by adding sodium chloride, which makes it possible to use a relatively thin slurry and thus facilitates the complete chlorination. The calcium hypochlorite can be separated by filtration and pressing, and the remaining solution can be treated with lime to precipitate basic hypochlorite which may be used in making up the lime slurry, or some of the solution may be used without treatment to dilute the chlorinated mixture. The use of thinner slurry enables the yield to be increased by about 10 per cent. A detailed example is given.

320,190. Eliminating Sulphur Compounds from Gases, Process for. J. Y. Johnson, London. From I.G. Farbenindustrie, Akt.-Ges., Frankfort-on-Main, Germany. Application date, August 25, 1928. Addition to 310,063.

The process is for removing sulphur compounds from gases containing substances having a reducing action. The gas is mixed with sufficient air or oxygen for the oxidation of the sulphur compounds to sulphur dioxide or trioxide and passed over a catalyst. The catalysts employed are highly porous inorganic adsorbents which are free from heavy metals or compounds, *e.g.*, active silica or alumina. The process is carried out above 400° C. and the catalysts have no action on those constituents of the gas other than sulphur compounds. The application to coke generator gas is described.

320,210. Crotonic Aldehyde, Production of. Holzverkohlungs-Industrie Akt.-Ges., Konstanz, Baden, and J. C. Seib, 41, Beethovenstrasse, Baden, Germany. Application date, September 13th, 1928.

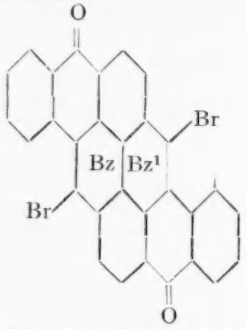
When acetic aldehyde is polymerised to form aldol in the presence of alkaline polymerising agents, and the aldol converted by heating into crotonic aldehyde, it has been found that this conversion is affected by the presence of salts of organic acids formed from acetic acid which may be present in the acetic aldehyde, or produced by oxidation. It is found that less than 1 per cent. of acetic acid causes the formation of about 10 per cent. of resin in the production of crotonic aldehyde. In this invention, salts of organic acids in the aldol are eliminated by converting them into inorganic salts by adding hydrochloric acid or sulphuric acid. The amount added should be sufficient to set free the organic acid, and to provide the equivalent of the alkali used as the polymerising agent. It has been found that crotonic aldehyde cannot be successfully obtained from acetic aldehyde derived from wood carbonization owing to the presence of methyl formate which becomes saponified on adding alkali. In this invention, such acetic aldehyde can be used if sufficient alkali is added to saponify the esters present. The inorganic acid added to the aldol should be equivalent to the amount of alkali used as the polymerising agent for the conversion of the acetic aldehyde into aldol, for the neutralisation of any organic acids present and for the saponification of any esters present. The reaction mixture is distilled, and some acetic aldehyde passes over, followed by a mixture of crotonic aldehyde and water which separates into two layers. The residue consists of a dry salt free from resins.

320,211. Olefines and Other Hydrocarbons, Production of. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, September 14, 1928. Addition to 301,775.

Specification No. 301,775 (see The Chemical Age, Vol. XX, p. 30) describes the production of gases rich in olefines by passing powdered or granular bituminous coal very quickly through a chamber at red heat and quickly separating the resulting gas from the carbon. This process is now applied to tar oils, mineral oils, and their distillation residues, asphalts, and residues obtained by destructive hydrogenation of coal, tar, mineral oil, etc. Granular porous substances such as pumice, slag, coke, etc., are impregnated with these substances and then treated at a red heat in the same manner as the pulverised coal. The rate of decomposition of the material may be varied by varying the size of the granules of the porous substance. Examples are given of the treatment of tar and oil, and the apparatus employed is described.

320,268. Vat Dyestuffs, Production of. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, November 19, 1928.

Pyranthrones are brominated in aqueous suspension with bromine or substances evolving bromine and in the presence or absence of catalysts such as iodine or iron chloride. If the hydrogen bromide is neutralised as quickly as it is produced, with caustic soda or potash, ammonia, alkali or alkaline earth or magnesium carbonates, secondary or tertiary phosphates, or urea, the product is almost entirely dibrompyranthrone. The products dye cotton more reddish shades than dibrompyranthrones previously obtained due to the presence of the two bromine atoms in the Bz-positions of the pyranthrone molecule. The product has the formula

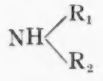


320,318. Alkali Phosphates and Ammonium Phosphates, Production of. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, June 8, 1928.

Alkali metal phosphates and ammonium phosphate are obtained by warming a mixture of dicalcium phosphate and alkali metal bisulphate or ammonium bisulphate. The temperature should not reach the sintering point of the mixture, *e.g.*, 60° C. The product is leached with water to obtain a saturated solution of the alkali metal or ammonium phosphate.

320,324. Water Soluble Secondary Diazo Amino Compounds and Azo Dyestuffs Therefrom, Manufacture of. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, July 4, 1928.

These compounds are obtained by the reaction of an aromatic diazo-, diazo-azo-, or tetrazo compound and a derivative of a secondary amine having the formula



where R_1 and R_2 represent alkyl, aryl, aralkyl, or hydroaromatic residues, and R_2 may be the same as or different from R_1, R_1 or R_2 or both are substituted by a group inducing solubility in water such as the sulphonic acid group or the carboxylic group, with the exception of the secondary amines obtained from primary amines and aldehyde-bisulphite compounds as described in Specification No. 309,610 (see The Chemical Age, Vol. XX, p. 595). These water-soluble diazo amino compounds are suitable for the manufacture of azo dyestuffs in substance or on the fibre by coupling with a suitable coupling component. A large number of examples of the diazo amino compounds and azo dyestuffs obtained from them are given.

NOTE.—Abstracts of the following specifications, which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention :—295,033 (I.G. Farbenindustrie Akt.-Ges.) relating to catalytic hydrogenation of aromatic bases, see Vol. XIX, p. 347 ; 295,990 (I.G. Farbenindustrie Akt.-Ges.) relating to condensation products of naphthalene and its derivatives, see Vol. XIX, p. 399 ; 296,700 (I.G. Farbenindustrie Akt.-Ges.) relating to conversion of high-boiling hydrocarbons into low-boiling hydrocarbons, see Vol. XIX, p. 441 ; 299,720 (Consortium für Elektrochemische Industrie Ges.) relating to acetone, see Vol. XX, p. 13 ; 301,845 (Soc. des Usines Chimiques Rhone Poulenc) relating to meth-amino-benzoyl derivative of dimethyl-amino-pentanol, see Vol. XX, p. 130 ; 303,026 (I.G. Farbenindustrie Akt.-Ges.) relating to developing dyestuffs, see Vol. XX, p. 214.

International Specifications Not Yet Accepted

318,832–3. DYES AND DYEING. Soc. of Chemical Industry in Basle, Switzerland. International Convention date, September 7, 1928.

318,832. This is an addition to 300,916. Artificial silks, other than cellulose esters or ethers, are dyed in level shades, fast to light, water, and washing, with chromium compounds of dyestuffs obtained by coupling *o*-oxydiazo or *o*-carboxydiazo compounds with 2:5:7-aminonaphthol-sulphonic acid or its N-acidyl. N-alkyl, N-aralkyl, or N-aryl derivatives. A number of examples of these dyestuffs and the tints obtained on viscose, are given.

318,833. Azo dyes are formed on the material by coupling a diazo compound with a leuco compound of a dyestuff or intermediate product capable of being absorbed, in its reduced form by the material. Leuco compounds of vat dyestuffs of the anthraquinone and indigoid series, and of sulphur dyestuffs, may be used. Examples are given.

318,834. DYES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, September 8, 1928.

Basic dyestuffs are precipitated as colour lakes from aqueous solutions, with or without a substratum, by means of naphthalene sulphonic acids, anthracene sulphonic acids, their hydrogenated derivatives and nuclear substitution derivatives. Thus an aqueous solution of Fuchsine, is the presence of aluminium hydroxide, freshly prepared from a solution of the sulphate by addition of calcined sodium carbonate, is precipitated by benzene sulphonic acid, *p*-brombenzene sulphonic acid, 1-nitro-anthraquinone-5-sulphonic acid, or 1:5-anthraquinone-disulphonic acid. The treatment of Victoria blue, Methyl violet, and others is described.

318,835. SYNTHETIC DRUGS. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, September 7, 1928.

An aqueous solution of diformaldehyde-bisulphite-arseno-(1-phenyl-2:3-dimethyl-4-amino-5-pyrazolone) is treated with sodium sulphite, carbonate, or phosphate, and the product precipitated by alcohol and ether.

318,837. DYE INTERMEDIATES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, September 7, 1929.

1-Methyl-2-halogen-3-chlor-4-aminobenzene is sulphonated with monohydrate at 180°-200°C., or with fuming sulphuric acid contining a molecular proportion of sulphur trioxide at 100°–130° C., to obtain the corresponding 5-sulphonic acid. If sulphonation with oleum containing an excess of sulphur trioxide is employed, the 6-sulphonic acid is obtained. If the starting substance is mixed with 1-methyl-2-halogen-5-chlor-4-aminobenzene, the latter remains unattacked, and the two bases may be separated in this manner. The sulphonic acid is freed from the sulphonic group by heating with dilute sulphuric acid. Several examples of these reactions are given.

319,205. ALKYLATING ORGANIC COMPOUNDS. Rheinische Kampfer Fabrik Ges., 305, Hansa-Allee, Oberkassel, Düsseldorf, Germany. International Convention date, September 17, 1928.

Organic compounds are alkylated or aralkylated by treating with unsaturated hydrocarbons by the action of activated hydrosilicates or silica obtained from them. To obtain the hydrosilicates, bleaching earths, clays, kaolin, etc., are treated with acids, *e.g.*, kaolin is heated to 100°–120° C. with 25 per cent. sulphuric acid, and the product washed and dried. Alkyl groups can be moved from one position to another in the molecule or may be transferred from one compound to another. Hydrocarbons such as propylene can be united with carboxylic acids, such as benzoic acid, to produce esters, and alcohols may be converted into ethers. Ammonia and amines may be alkylated, *e.g.*, by uniting with ethylene. The alkyl group may migrate to the nucleus in aromatic compounds. Thus, naphthalene may be heated to 250° C. with activated bleaching earth and treated with ethylene at 20–40 atmospheres to obtain polyethyl-naphthalenes. Similarly, cyclohexanol and benzene yield cyclohexyl-benzene, benzyl alcohol and benzene yield diphenyl-methane, ethyl alcohol is converted into ethyl ethers, benzoic acid and propylene yield isopropyl benzoate, phenol and methyl alcohol yield anisol and isomeric cresols, 6-chlor-*m*-cresol and propylene yield the corresponding isopropyl ether which is isomerised to 6-chlor-thymol, aniline and methyl alcohol yield dimethyl aniline.

319,247. DYES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, September 18, 1928.

Azo dyes are obtained by coupling a diazotized 5-halogen-2-amino-1-benzoic acid alkyl ester with a naphthylamide of 2:3-oxynaphthoic acid, and may be made in substance or on the fibre. Examples are given.

319,273. ORGANIC COMPOUNDS. Z. Foldi, 12B, Tatra-utsa, Budapest. International Convention date, September 19, 1928.

C-alkyl and C-aralkyl derivatives of aromatic compounds containing the alkyl or aralkyl group in the nucleus or alkyl side chains are obtained by treating the aromatic compound with an aromatic sulphonic ester. Esters of lower aliphatic alcohols react only at high temperatures forming mono- and poly-alkyl compounds, and esters of unsaturated aliphatic alcohols, *e.g.*, benzenesulphonic alkyl ester and esters of aromatic alcohols, *e.g.*, benzyl alcohol and phenylethyl carbinol react at lower temperatures. In an example, mono-, di-, and tri-ethylbenzenes are obtained from toluene sulphonic ethyl-ester and benzene, and several other examples are also given.

319,329. SULPHURIC ACID. Metallges. Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, September 20, 1928.

Sulphuric acid containing 0·4 per cent. of arsenic is passed through a series of pipes containing cylindrical lead cathodes enclosing an earthenware disphragm and a carbon anode. A voltage of 3 and a current density of 5 amps. per sq. cm. are employed, and the flow is regulated so that the effluent acid contains less than 0·002 per cent. of arsenic. The impurities are deposited as a sludge and are filtered off. Alkaline liquids containing arsenic and selenium may also be purified in this way, the impurities being first reduced to the trivalent form if necessary.

319,340. HYDROCARBONS. F. Fischer, 2, Kaiser-Wilhelm-Platz, Mülheim-on-Rühr, Germany. International Convention date, September 22, 1928.

Methane is converted to ethylene and benzene by passing it through a regenerative furnace, the time of heating in the hottest zone being not more than one second. The presence of iron, nickel, and cobalt is avoided, but filling bricks, etc., may be used.

319,356. IRON CARBONYL. Vereinigte Stahlwerke Akt.-Ges., 67, Breitestrasse, Düsseldorf, Germany. International Convention date, September 22, 1928.

The reaction of carbon monoxide on iron is accelerated by the presence of metallic copper. Copper oxide may be added to iron oxide before its reduction to iron.

319,365. DYES. Soc. of Chemical Industry in Basle, Switzerland. International Convention date, September 21, 1928.

Bz1 : Bz1¹-dibenzanthronyl is treated with a nitrating agent, and the product subjected, sometimes after reduction, to alkali fusion. The products are vat dyes giving fast blue-grey shades on cotton. They may be converted into other dyestuffs by halogenation, nitration, and oxidation followed by alkylation. These dyes may also be employed in the form of their leuco ester salts. Examples are given.

319,370 and 319,585. DYES AND LAKES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention dates, September 21 and 22, 1928.

319,370. Lakes for use in intaglio printing are obtained by

converting the monoazo dyestuffs from diazotized halogenated anilines and derivatives and 2-naphthol-6- or 7-sulphonic acids into their alkaline earth salts. The lakes are fast to light, oil, and water.

319,585. Azo dyes are obtained by coupling a diazo compound of a base of the formula.

$$NH_2\text{—aryl—}SO_2\text{—}N\begin{matrix}\text{aryl}\\ \text{R}\end{matrix}$$

where R=H or alkyl and the aryl nuclei may contain any substituent with an aryl-pyrazolone or a substitution product substituted in the aryl nucleus by halogen. The dyestuffs may be sulphonated. Examples of first and second components are given.

319,656. PHOSPHORIC ACID. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, September 25, 1928.

Metallic impurities or metalloids in phosphoric acid are removed by electrolysing with a cathode of copper, silver, chromium, platinum, or tantalum, employing a current density of less than 1 amp. per sq. cm. The impurities are deposited as a sludge, but the acid itself is not reduced.

318,839. DYES AND INTERMEDIATES. Soc. of Chemical Industry in Basle, Switzerland. Internatioanl Convention date, September 8, 1928. Addition to 315,400. (See THE CHEMICAL AGE, Vol. XXI, p. 244.)

Azo dyes are obtained by esterifying the hydroxy group in an aminonaphthol sulphonic acid and treating the ester with an oxidising agent and combining the azine-like condensation product with a diazo compound. In an example, J-acid is esterified with *p*-toluene-sulphonchloride to obtain 5 : 5^1-dioxy-7 : 7^1-disulpho-1 : 2 : 2^1 : 1^1-dinaphthazine, which is oxidised with alkali hypochlorite and hydrolysed. It yields the dihydro-azine on alkaline reduction. Several other examples are given in which the azine from J-acid is coupled with various compounds.

318,865. INDIARUBBER. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Nain, Germany. International Convention date, September 10, 1928.

Natural or artificial rubber is mixed with about 2·2 per cent. of an indane phenol obtained as described in specification 297,075 (see THE CHEMICAL AGE, Vol. XIX, p. 368.) Perishing of the rubber is thereby reduced.

319,794. SYNTHETIC DRUGS. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. (Assignees of Deutsche Gold- und Silber-Scheide-anstalt vorm. Roessler, 7, Weissfrauenstrasse, Frankfort-on-Main, Germany.) International Convention date, September 29, 1928.

A 2-halogen pyridine having a free 3-position, except 2-chlor pyridine-5-carboxylic acid methyl ester is condensed with anthranilic acid or a nuclear derivative at 150°–160° C. to obtain pyracridone and its derivatives. The products may be nitrated, and reduced to the amines.

Specifications Accepted with Date of Application

294,210. Ores, coals and the like, Process and apparatus for washing. L. Hoyois. July 20, 1927.

294,958. Inflammability of hydrogen, Method of reducing. Koku-Kenkyujo. August 2, 1927.

295,594. Dyestuffs, containing chromium, Manufacture of. Soc. of Chemical Industry in Basle. August 13, 1927.

295,694. Arylcarboxylic acid, amide-ortho-thioglycollic acids,and hydroxy-thionaphthenes, Manufacture of. I.G. Farbenindustrie Akt.-Ges. August 17, 1927.

295,716. Leuco compounds of vat dyestuffs. E. I. Du Pont de Nemours and Co. August 19, 1927.

296,984. Non-knocking fuels of the benzine type, Manufacture of by destructive hydrogenation. I.G. Farbenindustrie Akt.-Ges. September 10, 1927.

299,048. Acetone from acetylene, Manufacture of. I.G. Farbenindustrie Akt.-Ges. October 21, 1927.

299,445. Alkali iodate, Manufacture of—and its application to the manufacture of oxygen. I.G. Farbenindustrie Akt.-Ges. October 28, 1927. Addition to 290,749.

299,791. Azo-dyestuffs, Manufacture of. Soc. of Chemical Industry in Basle. October 31, 1927.

300,919. Ammoniacal and potassium phosphates, Preparation of. Soc de Produits Chimiques des Terres Rares. November 19, 1927.

302,142. Accelerator of vulcanisation. Goodyear Tire and Rubber Co. December 10, 1927.

304,118. Ketonic acid esters, Manufacture of. A. Wacker Ges. für Elektro-Elektro-Chemische Industrie Ges. January 14, 1928.

310,507. Nitrous oxide, Manufacture of. W. Friederich. April 27, 1928.

321,651. Cellulose ethers, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) August 9, 1928.

321,685. Copper and other metals from copper-bearing ores, Recovery of. F. L. Duffield. August 15, 1928.

321,698. Evaporation or distillation, Methods of and means for. A. E. White. (*Swenson Evaporator Co.*) May 18, 1928.

311,699. Vulcanisation or sulphurisation of organic isocolloids. L. Auer and N. Stracovsky. June 13, 1928.

321,703. Vat dyestuffs, Manufacture and production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) August 9, 1928.

321,720. Calcium hypochlorite, Manufacture of. L. Mellersh-Jackson. (*Mathieson Alkali Works.*) August 18, 1928.

321,728. Nitric acid, Manufacture of highly concentrated. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) June 21, 1928.

321,737. Dyestuffs on the fibre, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) August 21, 1928.

321,738. Phenylcarboxylic acid compounds, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) August 21, 1928.

321,843. Aliphatic and cycloaliphatic saturated sulphinic acids, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) November 26, 1928.

321,894. Carbonic acid esters of the glycols, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) February 18, 1929.

Applications for Patents

[*In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.*]

Berl, E. Manufacture of acetic anhydride. 36,540. November 28. (Austria, November 30, 1928.)

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of tanning materials. 36,247. November 26.

—— Manufacture of hormones. 36,711. November 29.

—— Textile printing by vat, etc., dyestuffs. 36,780. November 30.

Carter, C., and Imperial Chemical Industries, Ltd. Manufacture of bleaching powder. 36,130. November 26.

Du Pont de Nemours and Co., E. I. Acid inhibitors. 36,464. November 28. (United States, June 21.)

Groves, W. W., and I.G. Farbenindustrie Akt.-Ges. Manufacture of artificial fibres from viscose. 36,662. November 29.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of condensation products of urea, etc. 36,057. November 25. (October 6, 1928.)

—— and Johnson, J. Y. Production of vat dyestuffs. 36,058. November 25.

—— and Johnson, J. Y. Apparatus for production of films, etc. 36,694. November 29.

I.G. Farbenindustrie Akt.-Ges. Insecticides. 36,118. November 25. (Germany, November 26, 1928.)

—— Sulphonating pyridine, etc. 36,239. November 26. (Germany, November 26, 1928.)

—— Manufacture of β-hydroxy α-picoline. 36,240. November 26. (Germany, November 26, 1928.)

—— Production of molybdates of the alkaline-earth metals, etc. 36,354. November 27. (Germany, December 8, 1928.)

—— Manufacture of amines. 36,361. November 27. (Germany, November 27, 1928.)

—— Device for measuring liquids. 36,363. November 27. (Germany, November 27, 1928.)

—— Lubricating, etc., oils. 36,522. November 28. Germany, November 29, 1928.)

—— Photographic film packs. 36,665. November 29. (Germany, November 29, 1928.)

—— Photographic roll films. 36,666. November 29. (Germany, November 29, 1928.)

—— Photographic reducers. 36,667. November 29. (Germany, November 29, 1928.)

—— Manufacture of bismuth hydroxide. 36,781. November 30. (Germany, December 3, 1928.)

Imperial Chemical Industries, Ltd. Storing acetylene. 36,484. November 28.

—— Manufacture of nitrocellulose products. 36,545. November 28.

—— and Tate, W. R. Destructive hydrogenation of carbonaceous materials. 36,676, 36,677. November 29.

—— and Saunders, K. H. Manufacture of water insoluble azo dyestuffs. 36,699. November 29.

Schotz, S. P. Production of bleaching agents. 36,411. November 28.

Stapp, P. Storing and handling carbonic acid. 36,771. November 30. (Germany, December 3, 1928.)

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £20 per ton; powder, £21 per ton; extra fine powder, £23 per ton. Packed in 2 cwt. bags carriage paid any station in Great Britain.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength and locality.

ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 3d. to 1s. 8d. per gall. pyridinised industrial, 1s. 5d. to 1s. 10d. per gall.; mineralised 2s. 4d. to 2s. 8d. per gall.; 64 O.P., 1d. extra in all cases.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4⅜d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex-wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3⅜d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—7d. to 10d. per lb. Crude 60's, 2s. 5½d. to 2s. 6d. per gall.

ACID CRESYLIC 99/100.—2s. 2d. to 2s. 7d. per gall. Pure, 5s. 6d. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Pale, 95%, 1s. 9d. to 1s. 10d. per gall. 98%, 2s. 2d. to 2s. 5d. Dark, 1s. 6d. to 2s. 2d. Refined, 2s. 7d. to 2s. 10d. per gall.

ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.

ANTHRACENE OIL, STRAINED, 1080/1090.—4¾d. to 5¼d. per gall. 1100, 5¼d. to 6d. per gall.; 1110, 6d. to 6¼d. per gall. Unstrained (Prices only nominal).

BENZOLE.—Prices at works: Crude, 10d. to 11d. per gall.; Standard Motor, 1s. 5d. to 1s. 6d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall; Pure, 1s. 10d. to 1s. 11d. per gall.

TOLUOLE.—90%, 1s. 9d. to 2s. 1d. per gall. Firm. Pure, 1s. 11d. to 2s. 4d. per gall.

XYLOL.—1s. 5d. to 1s. 10d. per gall. Pure, 1s. 8d. to 2s. 1d. per gall.

CREOSOTE.—Cresylic, 20/24%, 6¾d. to 7d. per gall.; Heavy, 6¼d to 6¾d. per gall. Middle oil, 4¼d. to 5d. per gall. Standard specification, 3d. to 4d. per gall. Light gravity, 2d. to 2¾d. per gall. ex works. Salty, 7¼d. per gall.

NAPHTHA.—Crude, 8¼d. to 8¾d. per gall. Solvent, 90/160, 1s. 3d. to 1s. 3½d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 5d. per gall. Solvent 90/190, 1s. to 1s. 3d. per gall.

NAPHTHALENE, CRUDE.—Drained Creosote Salts, £4 10s. to £5 per ton. Whizzed, £5 per ton. Hot pressed, £8 10s. per ton.

NAPHTHALENE.—Crystals, £12 5s. per ton. Purified Crystals, £14 10s. per ton. Quiet. Flaked, £14 to £15 per ton, according to districts.

PITCH.—Medium soft, 47s. 6d. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 3s. 9d. to 4s. per gall. 90/160, 3s. 6d. to 3s. 9d. per gall. 90/180, 1s. 9d. to 2s. 3d. per gall. Heavy, prices only nominal.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 8¼d. per lb.

ACID GAMMA.—4s. 6d. per lb.

ACID H.—3s. per lb.

ACID NAPHTHIONIC.—1s. 6d. per lb.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb.

ACID SULPHANILIC.—8¼d. per lb.

ANILINE OIL.—8d. per lb. naked at works.

ANILINE SALTS.—8d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8¼d. per lb.

o-CRESOL 29/31° C.—£3 1s. 10d. per cwt., in 1 ton lots.

m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots d/d.

p-CRESOL 32/34° C.—2s. per lb., in ton lots d/d.

DICHLORANILINE.—1s. 10d. per lb.

DIMETHYLANILINE.—1s. 11d. per lb.

DINITROBENZENE.—8d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 7½d. per lb. naked at works. 66/68° C, 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—10d. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb.

B-NAPHTHYLAMINE.—3s. per lb.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 8d. per lb.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb.

R. SALT.—2s. 2d. per lb.

SODIUM NAPHTHIONATE.—1s. 8¼d. per lb. 100% basis d/d.

o-TOLUIDINE.—8d. per lb.

p-TOLUIDINE.—1s. 9d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 6d. per lb. 100%.

N. W. ACID.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 15s. to £10 5s. per ton. Grey, £16 10s. to £17 10s. per ton. Liquor, 9d. per gall.

ACETONE.—£78 per ton.

CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.

IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10½d. per gall. 16° Tw.

WOOD CRESOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 8d. to 3s. 11d. per gall. Solvent, 4s. to 4s. 3d. per gall.

WOOD TAR.—£3 10s. to £4 10s. per ton.

BROWN SUGAR OF LEAD.—£38 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 3d. per lb. according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 10d. to 2s. per lb.

BARYTES.—£5 10s. to £7 per ton, according to quality.

CADMIUM SULPHIDE.—5s. to 6s. per lb.

CARBON BISULPHIDE.—£25 to £27 10s. per ton, according to quantity

CARBON BLACK.—5¼d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—4½d. to 5½d. per lb.

LAMP BLACK.—£30 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£20 to £22 per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London

SULPHUR.—£10 to £13 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra

SULPHUR PRECIP. B. P.—£55 to £60 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb., carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. 6d. to 6s. 9d. per lb.

ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£37 per ton ex wharf London, barrels free.

ACID, ACETYL SALICYLIC.—2s. 9d. to 2s. 11d. per lb., according to quantity.

ACID, BENZOIC, B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.

ACID, BORIC B.P.—Crystal, £32 per ton; powder, £36 per ton; extra fine powder, £38 per ton. Packed in 2-cwt. bags carriage paid any station in Great Britain.

ACID, CAMPHORIC.—19s. to 21s. per lb.

ACID, CITRIC.—1s. 11d. to 2s. per lb., less 5%.

ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.

ACID, MOLYBDIC.—5s. 3d. per lb. in ¼ cwt. lots. Packages extra. Special prices for quantities and contracts.

ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.

ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 7d. per lb. Technical.—1s. to 1s. 2d. per lb.

ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.

ACID, TARTARIC.—1s. 4¼d. per lb., less 5%.

ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.

AMIDOL.—7s. 6d. to 9s. per lb., d/d.

AMIDOPYRIN.—7s. 9d. to 8s. per lb.

AMMONIUM BENZOATE.—3s. 3d. to 3s. 9d. per lb., according to quantity. 18s. per lb. ex Gum.

AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.

AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ¼ cwt. lots. Packages extra. Special prices for quantities and contracts.

ATROPHINE SULPHATE.—9s. per oz.

BARBITONE —5s. 9d. to 6s. per lb.

BENZONAPHTHOL.—3s. to 3s. 3d. per lb. spot.

BISMUTH CARBONATE.—8s. 9d. per lb.

BISMUTH CITRATE.—8s. 3d. per lb.

BISMUTH SALICYLATE.—8s. 3d. per lb.

BISMUTH SUBNITRATE.—7s. 6d. per lb.

BISMUTH NITRATE.—Cryst. 5s. 3d. per lb.

BISMUTH OXIDE.—11s. 3d. per lb.

BISMUTH SUBCHLORIDE.—10s. 3d. per lb.

BISMUTH SUBGALLATE.—7s. 3d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.

BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W Qts. 11d. per lb.

BORAX B.P.—Crystal, £20 per ton; powder, £21 per ton. Packed in 1- or 2-cwt. bags carriage paid any station in Great Britain.

BROMIDES.—Ammonium, 1s. 11½d. per lb.; potassium, 1s. 8½d. per lb.; granular, 1s. 7½d. per lb.; sodium, 1s. 10½d. per lb. Prices for 1 cwt. lots.

CALCIUM LACTATE.—B.P., 1s. 2d. to 1s. 3d per lb., in 1-cwt. lots.

CAMPHOR.—Refined flowers, 3s. 3d. to 3s. 4d. per lb., according to quantity; also special contract prices.

CHLORAL HYDRATE.—3s. 1d. to 3s. 4d. per lb.

CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.

CREOSOTE CARBONATE.—6s. per lb.

ETHERS.—S.G. ·730—11d. to 1s. per lb., according to quantity other gravities at proportionate prices.

FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.

GUAIACOL CARBONATE.—4s. 6d. to 4s. 9d. per lb.

HEXAMINE.—2s. 3d. to 2s. 6d. per lb.

HOMATROPINE HYDROBROMIDE.—30s. per oz.

HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.

HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.

HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.

HYPOPHOSPHITES.—Calcium, 2s. 5d. per lb.; potassium, 2s. 8½d. per lb.; sodium, 2s. 7½d. per lb., in 1 cwt. lots, assorted.

IRON AMMONIUM CITRATE.—B.P., 2s. 8d. to 2s. 11d. per lb. Green, 3s. 1d. to 3s. 4d. per lb. U.S.P., 2s. 9d. to 3s. per lb.

IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.

IRON QUININE CITRATE.—B.P., 8½d. to 9½d. per oz., according to quantity.

MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.

MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.

MENTHOL.—A.B.R. recrystallised B.P., 18s. 6d. per lb. net; Synthetic, 9s. 6d. to 11s. per lb.; Synthetic detached crystals 9s. 6d. to 12s. 6d. per lb., according to quantity; Liquid (95%), 9s. per lb.

MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.

METHYL SALICYLATE.—1s. 6d. to 1s. 8d. per lb.

METHYL SULPHONAL.—18s. 6d. to 20s. per lb.

METOL.—9s. to 11s. 6d. per lb. British make.

PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.

PARALDEHYDE.—1s. 4d. per lb.

PHENACETIN.—3s. 2½d. to 3s. 9d. per lb.

PHENAZONE.—5s. 11d. to 6s. 1½d. per lb.

PHENOLPHTHALEIN.—5s. 11d. to 6s. 1½d. per lb.

POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—104s. per cwt., less 2½ per cent.

POTASSIUM CITRATE.—B.P.C., 2s. 7d. per lb. in 1 cwt. lots.

POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.

POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.

POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included f.o.r. London.

POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.

QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.

RESORCIN.—2s. 10d. to 3s. per lb., spot.

SACCHARIN.—43s. 6d. per lb.

SALOL.—2s. 3d. to 2s. 6d. per lb.

SODIUM BENZOATE, B.P.—1s. 8d. to 1s. 11d. per lb.

SODIUM CITRATE, B.P.C., 1911.—2s. 4d. per lb., B.P.C. 1923—2s. 7d. per lb. Prices for 1 cwt. lots. U.S.P., 2s. 6d. to 2s. 9d. per lb., according to quantity.

SODIUM FERROCYANIDE.—4d. per lb., carriage paid.

SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.

SODIUM NITROPRUSSIDE.—16s. per lb.

SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—100s. per cwt. Crystals, 5s. per cwt. extra.

SODIUM SALICYLATE.—Powder, 2s. 2d. to 2s. 4d. per lb. Crystal, 2s. 3d. to 2s. 5d. per lb.

SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 1d. per lb.

SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £29 10s. per ton, according to quantity. Delivered U.K.

SULPHONAL.—9s. 6d. to 10s. per lb.

TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.

THYMOL.—Puriss., 9s. 1d. to 9s. 4d. per lb., according to quantity. Firmer. Natural, 12s. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.

AUBEPINE (EX ANETHOL).—12s. per lb.

AMYL ACETATE.—2s. 6d. per lb.

AMYL BUTYRATE.—5s. per lb.

AMYL CINNAMIC ALDEHYDE.—12s. 6d. per lb.

AMYL SALICYLATE.—2s. 9d. per lb.

ANETHOL (M.P. 21/22° C.).—6s. per lb.

BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.

BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. per lb.

BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb.

BENZYL BENZOATE.—2s. 3d. per lb.

CINNAMIC ALDEHYDE NATURAL.—13s. 3d. per lb.

COUMARIN.—8s. 9d. per lb.

CITRONELLOL.—9s. per lb.

CITRAL.—8s. per lb.

ETHYL CINNAMATE.—6s. 6d. per lb.

ETHYL PHTHALATE.—2s. 9d. per lb.

EUGENOL.—11s. 3d. per lb.

GERANIOL (PALMAROSA).—19s. per lb.

GERANIOL.—7s. 6d. to 10s. per lb.

HELIOTROPINE.—6s. 9d. per lb.

ISO EUGENOL.—12s. 6d per lb.

LINALOL.—Ex Bois de Rose, 12s. per lb. Ex Shui Oil, 10s. per lb.

LINALYL ACETATE.—Ex Bois de Rose, 15s. per lb. Ex Shui Oil, 12s. per lb.

PHENYL ETHYL ACETATE.—11s. per lb.

PHENYL ETHYL ALCOHOL.—9s. 6d. per lb.

RHODINOL.—48s. per lb.

SAFROL.—2s. 3d. per lb.

TERPINEOL.—1s. 6d. per lb.

VANILLIN, EX CLOVE OIL.—14s. to 15s. per lb. Ex Guaiacol, 12s. 9d. to 14s. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. per lb.

ANISE OIL.—4s. per lb.

BERGAMOT OIL.—14s. 9d. per lb.

BOURBON GERANIUM OIL.—18s. 6d. per lb.

CAMPHOR OIL, WHITE.—160s. per lb.

CANANGA OIL, JAVA.—11s. 6d. per lb.

CASSIA OIL, 80/85%.—5s. 6d. per lb.

CINNAMON OIL LEAF.—8s. 6d. per oz.

CITRONELLA OIL.—Java, 3s. 4d. per lb., c.i.f. U.K. port.

CLOVE OIL (90/92%).—8s. per lb.

EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%.—1s. 10d. per lb.

LAVENDER OIL.—Mont Blanc, 38/40%, 13s. 6d. per lb.

LEMON OIL.—11s. 6d. per lb.

LEMONGRASS OIL.—4s. per lb.

ORANGE OIL, SWEET.—14s. 6d. per lb.

PEPPERMINT OIL.—English, 70s. per lb.; Wayne County, 15s. 6d. per lb.; Japanese, 5s. 3d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, December 5, 1929.

THE demand from consumers has been up to the average, prices continuing along steady lines with very little alteration in values. Export business is satisfactory.

General Chemicals

ACETONE.—There is a steady demand at £76 10s. to £85 per ton according to quantity, with the market firm.

ACETIC ACID.—Quite steady conditions control this market, with a regular demand. Prices unchanged at £36 10s. for 80% technical, with £1 per ton extra for 80% edible.

CITRIC ACID is slow of sale, and there is no further alteration in values, which are now steady at 2s. 1½d. per lb., less 5%.

ACID LACTIC is in steady request at £43 per ton for the 50% weight pale qualities.

ACID OXALIC.—There is a firmer tendency in this section, with prices hardening at £30 7s. 6d. to £32 per ton, according to quantity, and with a substantial demand.

TARTARIC ACID.—In slightly better request, with values unchanged at 1s. 4½d. to 1s. 5d. per lb., less 5%.

ALUMINA SULPHATE.—Active with brisk inquiry at £8 to £8 5s. per ton for 17/18% iron-free quality.

ARSENIC.—Rather more activity is shown in this market, with price a little steadier at £16 17s. 6d. f.o.r. the mines.

BORAX.—In steady request at £13 per ton.

CREAM OF TARTAR.—Inquiry is improving, and the market is now steady at £104 to £106 per ton for 99/100% B.P. quality.

COPPER SULPHATE.—Substantial inquiries are being received, and the market is firm at £28 per ton, less 5%.

FORMALDEHYDE.—There is a steady demand, with the market unaltered at £36 per ton.

LEAD ACETATE.—White quality is in good request at about £44 per ton, and brown at about £43 per ton.

LEAD NITRATE.—An improving demand is coming to hand, with the market unchanged at £33 15s. per ton.

LIME ACETATE.—In better supply, with prices unchanged.

LITHOPONE.—There is rather more inquiry for this product, with prices firm at £19 15s. to £23 per ton, according to quantity.

POTASSIUM CARBONATE is in good request, with price firm at £27 for 96/98% best quality.

CHLORATE OF POTASH.—Demand is on the increase, with the market firm at about £30 per ton.

PERMANGANATE OF POTASH.—There is an improving demand, with best B.P. needle crystal quality at 5¼d. to 5¾d. per lb.

SODIUM ACETATE.—The market is receiving a good demand, and the product is firm at £22 to £22 10s. per ton.

SODIUM BICHROMATE.—Good business is being booked at the unchanged rate of 3⅜d. per lb., with the usual rebates for contracts.

SODIUM HYPOSULPHITE.—Commercial quality in rather better request at £8 10s. to £9 per ton, with photographic pea crystals rather slow at £14 10s. to £15 per ton.

SODIUM NITRITE.—Active at £20 per ton.

SODIUM PHOSPHATE.—Rather more business is passing, with dibasic at £12, and tribasic at £17 10s. per ton. Both ruling firm.

SODIUM PRUSSIATE.—Active at 4¾d. to 5¼d. per lb., according to quantity, with the tendency firm.

SODIUM SULPHIDE.—Steady business is passing at the new values, with the market firm.

TARTAR EMETIC.—Unaltered at 11d. per lb., and in steady request.

ZINC SULPHATE continues scarce for early delivery, with the market firm at £13 10s. per ton.

Coal Tar Products

The coal tar products market remains quiet, with no change to report in prices from last week.

MOTOR BENZOL remains firm at about 1s. 5½d. to 1s. 6d. per gallon, f.o.r.

SOLVENT NAPHTHA is unchanged at about 1s. 2½d. to 1s. 3d. per gallon, f.o.r.

HEAVY NAPHTHA is quoted at about 1s. 1d. per gallon, f.o.r.

CREOSOTE OIL remains at 3d. to 3½d. per gallon on rails in the North, and at 4d. to 4½d. per gallon in London.

NAPHTHALENES.—The fire lighter quality is quoted at £4 per ton, the 74/76 quality at about £4 10s. per ton, and the 76/78 quality at about £5 per ton.

PITCH.—The price remains nominally at 47s. 6d. per ton f.o.b. East Coast port, but the market begins to show signs of weakness.

Nitrogen Products

Sulphate of Ammonia.—The market for sulphate of ammonia remains weak, the price being about £8 10s. per ton, f.o.b., U.K. port, in single bags, for neutral quality basis 20·6 per cent. nitrogen. Small lots of material on the Continent appear to be sold at somewhat lower prices, but these are probably ordinary quality.

Home.—The home prices for January onwards have not yet been announced, so there is little interest in the home market.

Nitrate of Soda.—It is reported from America that there is no improvement in buying of the Chilean product for prompt or forward positions. Although only small sales of synthetic nitrogen have been reported, the bookings for this product for the year have now assumed an impressive volume. In Europe and Egypt shipments continue to be on a large scale, but deliveries to consumers are not so satisfactory.

Latest Oil Prices

LONDON, December 4.—LINSEED OIL closed quieter and 2s. 6d. to 10s. per ton lower. Spot, ex mill, £45 15s.; December, £43; January-April, £40 17s. 6d.; and May-August, £38 15s., naked. RAPE OIL was inactive. Crude extracted, £42 10s.; technical refined, £44, naked, ex wharf. COTTON OIL was steady. Egyptian crude, £29; refined common edible, £34; and deodorised, £36, naked, ex mill. TURPENTINE was steady but quiet at occasionally 3d. per cwt. advance. American, spot, 42s. 6d. and January-April, 43s. 6d.

HULL.—LINSEED OIL, spot to December, £44 10s.; January-April, £43; May-August, £39 15s. COTTON OIL, crude Egyptian, spot, £29; November-December, £28 10s.; edible refined, spot, £32; technical, spot, £31 10s.; deodorised, spot, £34. PALM KERNEL OIL, crude, 5½ per cent., spot, £32 10s. GROUNDNUT OIL, crushed-extracted, spot, £34 10s.; deodorised, spot, £38 10s. SOYA OIL, extracted and crushed, spot, £31 10s.; deordorised, spot, £35. RAPE OIL, crushed-extracted, spot, £41 10s.; refined, spot, £43 10s. per ton. TURPENTINE, CASTOR OIL and COD OIL unchanged.

Reduction in Price of Platinum

JOHNSON MATTHEY AND CO., LTD., report that the price of platinum was reduced on December 2 from £13 10s. to £13 per ounce.

Scottish Coal Tar Products

THERE is a better feeling in this market, and trading in certain products is quite brisk. Pitch and tar are in steady demand, with prices firm. Cresylic acid is still very scarce, particularly for prompt delivery.

Cresylic acid.—There is no change in the position since last report. Makers are quoting to-day's prices for forward delivery. Pale 97/99% is 1s. 11½d. to 2s. 0½d., Dark 97/99%, 1s. 9½d. to 1s. 10½d.; Pale 99/100%, 2s. 2d. to 2s. 4d.; High Boiling, 2s. to 2s. 2d., all per gallon free on rails works in buyers' packages.

Carbolic sixties.—There being no stocks in this area price is nominal at 2s. 6d. to 2s. 8d. per gallon.

Creosote oil is a poor market, with prices easy and supply much greater than the demand. B.E.S.A. specification is cheaper at 4d. to 4½d. per gallon, while gasworks ordinary and washed oil are unaltered at 3d. to 3½d. and 3¼d. to 3⅝d. per gallon respectively.

Coal tar pitch is in better demand, and prices are firm as follows:—Coke oven and horizontal, 52s. 6d. to 55s. per ton; vertical, 50s. to 52s. 6d. per ton. Export value remains nominal at about 5s. per ton lower than these quotations.

Refined coal tar is in fair demand for delivery next season, and value remains steady at 3¾d. to 4d. per gallon, ex works in buyers' packages.

Crude naphtha is unchanged at 5d. to 6d. per gallon according to district.

Water white products are quiet, and stocks are accumulating. 90/160 solvent is 1s. 1½d. to 1s. 2d.; heavy solvent 90/190, 1s. to 1s. 0½d.; benzol, 1s. 5d. to 1s. 5½d., all per gallon rails makers' works.

South Wales By-Products

THERE is slightly more activity in South Wales by-products. The pitch demand, although irregular, is of a good average, with values lower at 47s. 6d. to 49s. 6d. delivered. Road tar is stronger at 11s. to 14s. per 40-gallon barrel. Solvent naphtha has a better demand, with prices unchanged at 1s. 2½d. to 1s. 4½d. per gallon. Heavy naphtha has practically no call at 11d. to 1s. 1d. per gallon. Creosote is in poor request with quotations unchanged at 3d. to 4½d. per gallon. Refined tars have a moderately good demand with prices unchanged.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, December 4, 1929.

PRICES during the past week for heavy chemicals remain practically on the same basis as when we last reported. A number of inquiries are being received for waxes for home consumption, although quantities called for are not very large. Prices on the whole are still fairly steady and there is no sign of advancement at present.

Industrial Chemicals

ACETONE, B.G.S.—£76 10s. to £85 per ton, ex wharf, according to quantity. Inquiry remains satisfactory.

ACID ACETIC.—This material is still scarce for immediate supply, but prices remain unchanged as follows: 98/100% glacial, £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80% pure, £37 10s. per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton. Powder, £32 per ton, packed in bags, carriage paid U.K. stations. There are a few fairly cheap offers made from the Continent.

ACID CARBOLIC, ICE CRYSTALS.—Prompt delivery difficult to obtain and prices quoted for early delivery round about 8d. per lb., delivered or f.o.b. U.K. ports.

ACID CITRIC, B.P. CRYSTALS.—Quoted 2s. 2d. per lb., less 5%, ex store, prompt delivery. Rather cheaper offers for early delivery from the Continent.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy; dearsenicated quality, 5s. 6d. per carboy, ex works, full wagon loads.

ACID NITRIC, 80° QUALITY.—£24 10s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—On offer at about 3¼d. per lb., ex store. Offered from the Continent at 3⅛d. per lb., ex wharf.

ACID SULPHURIC.—£2 15s. per ton ex works for 144° quality; £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC, B.P. CRYSTALS.—Quoted 1s. 5d. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 1s. 4½d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Quoted at round about £7 10s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 7s. 6d. per ton, c.i.f. U.K. ports. Crystal meal about 2s. 6d. per ton less.

AMMONIA, ANHYDROUS.—Quoted 7½d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton, powdered £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Spot material quoted £37 per ton, ex wharf. On offer for prompt shipment from China at £34 per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Now quoted £18 per ton, ex wharf, prompt despatch from mines. Spot material still on offer at £19 15s. per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £11 per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 12s. 6d. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price £4 5s. per ton to £4 15s. per ton, according to quantity and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works, or £4 12s. 6d. per ton f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Remains steady at about £36 10s. per ton, ex works.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 5s. per ton, ex wharf.

LEAD, RED.—Price now £37 10s. per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £37 10s. per ton, c.i.f. U.K. ports.

LEAD ACETATE.—White crystals quoted round about £39 to £40 per ton, ex wharf. Brown on offer at about £2 per ton less.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 O.P. quoted 1s. 4d. per gallon, less 2½%, delivered.

POTASSIUM BICHROMATE.—Quoted 4⅜d. per lb. delivered U.K. or c.i.f. Irish ports, with an allowance of 2½% for minimum 2½ tons to be taken.

POTASSIUM CARBONATE.—Spot material on offer at £26 10s. per ton ex store. Offered from the Continent at £25 5s. per ton c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99½/100% POWDER.—Quoted £25 10s. per ton ex wharf. Crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb., ex store. Offered for prompt delivery from the Continent at about 6¾d. per lb. ex wharf.

SODA, CAUSTIC.—Powdered 98/99% £17 10s. per ton in drums, £18 15s. per ton in casks. Solid 76/77% £14 10s. per ton in drums, and £14 12s. 6d. per ton for 70/75% in drums, all carriage paid buyers' stations, minimum 4-ton lots, for contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3⅝d. per lb. delivered buyers' premises with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or Pea quality 27s. 6d. per ton extra. Light soda ash £7 1s. 3d. per ton ex quay, minimum 4-ton lots with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots. Prices for this year unchanged.

SODIUM NITRATE.—Chilean producers are now offering at £9 9s. per ton, carriage paid buyers' sidings, minimum 6-ton lots, but demand in the meantime is small.

SODIUM PRUSSIATE.—Quoted 5¼d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Prices 50s. per ton, ex works, 52s. 6d. per ton, delivered for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption. Solid 60/62% £9 per ton. Broken 60/62% £10 per ton. Crystals 30/32% £7 2s. 6d. per ton delivered buyers' works on contract, minimum 4-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £10 7s. 6d. per ton; ground American, £9 5s. per ton; ex store.

ZINC CHLORIDE, 98%.—British material now offered at round about £20 per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £10 per ton, ex wharf.

NOTE.—Please note that the above prices are for bulk business and are not to be taken as applicable to small parcels.

New German Synthetic Ammonia Plant

WORK has been commenced at Oer-Erkenschwick (Herten/Westphalia) on the erection of a synthetic ammonia plant for the mining companies Gewerkschaft Ewald (members of the Ruhr-Chemie A.-G.) and Koenig Ludwig. It is intended to use an American process using a pressure of 300 atmospheres and recovering 20 to 22 per cent. of ammonia on the first run. The Ewald-Koenig Ludwig plant will be one of the five small synthetic ammonia plants erected or in course of erection to use hydrogen separated from coke-oven gas. It is asserted that this will result in a product cheaper than that obtained by the usual Haber-Bosch method. The Ewald concern has acquired a number of shares in the Koenig Ludwig concern, including some formerly owned by the I.G. The outstanding financier behind the Ewald-Koenig Ludwig combination is Simon Horschland, of Essen. Including his shares, Ewald owns 331 mining shares of Koenig Ludwig. The Ewald operation, however, will be further financed by a foreign loan, negotiations for which are in process.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, December 5, 1929.

Business in chemical products on this market during the past week has been on moderate lines, so far as the principal heavy materials are concerned. There is a fairly steady call for deliveries against unexpired contracts for this year, and fair bookings on account of 1930 deliveries of the alkali and other products have been reported. Values are steady to firm in pretty well all directions, though most people are still working on relatively small margins.

Heavy Chemicals

The demand for phosphate of soda this week had been on rather quiet lines, but quotations for this material are maintained at round £11 per ton for the dibasic. Prussiate of soda is moving off in fair quantities and prices are firm at 4¾d. to 5¼d. per lb., according to quantity. A fair amount of buying interest is being shown in the case of bichromate of soda, which is quoted on the basis of 3⅝d. per lb. for contract deliveries over the first six months of next year. Chlorate of soda is attracting only moderate attention at the moment, with current values in this section at from 2½d. to 2¾d. per lb. Some quiet contract bookings for 1930 have been reported in the case of sulphide of sodium, with the 60-65 per cent. concentrated quality ranging from £10 to £14 per ton, in contracts and according to quantity, and the crystallised material at from £8 2s. 6d. to £9 2s. 6d. per ton. Caustic soda continues to attract a fair amount of attention, with prices firm at from £12 15s. to £14 per ton, in contract commitments. With regard to alkali and bicarbonate of soda, buying interest in these sections runs on moderate lines and offers keep up at round £6 and £10 10s. per ton, respectively. A quiet trade is going through in the case of hyposulphite of soda, current offers of which are at round £15 per ton for the photographic quality and £9 to £9 5s. for the commercial grade. Saltcake is steady and meets with some inquiry at about £2 17s. 6d. per ton.

Among the potash products, permanganate is rather a quiet section, although prices of this are reasonably steady at 5⅜d. to 5½d. per lb. for the B.P. quality and about 5¼d. per lb. for the commercial. A steady trade is passing in the case of yellow prussiate of potash, offers of which are well held at from 6¾d. to 7¼. per lb., according to quality. Caustic potash is moving in moderate quantities at from £32 to £32 10s. per ton. Carbonate of potash is firm and a quietly steady business is being done at up to £26 5s. per ton. Contract offers of bichromate of potash are on the basis of 4⅜d. per lb., and sales of this material keep up fairly well. Chlorate of potash is only in comparatively quiet demand, but prices are steady at about 2⅞d. per lb.

There has been no appreciable easing in the case of arsenic, although the demand in this section is rather slow; white powdered, Cornish makes, are quoted at round £16 per ton at the mines. Sulphate of copper is not particularly active for export, but there has been little change in the position of prices, current offers being at up to £27 per ton, f.o.b. There is a moderate demand about for the acetates of lime, with grey quoted at about £16 per ton and brown at £7 15s. The lead compounds are in quiet call and in some instances the tendency seems to be easy, acetate being on offer at £39 10s. to £40 per ton for white and £39 for brown, and nitrate at about £33.

Acids and Tar Products

Citric acid is attracting only moderate attention with values at round 2s. per lb. Only a quiet trade is being done also in the case of tartaric acid, which is readily obtainable at about 1s. 4¼d. per lb. With regard to oxalic acid, offers of this are well held at £1 13s. per cwt., ex store, a fair inquiry being met with. Acetic acid is in steady request and prices are firm at about £36 per ton for the 80 per cent. commercial product and £66 per ton for the glacial.

Pitch prices keep up at about 47s. 6d. per ton, f.o.b., but only a very moderate business has been done during the past week. With regard to creosote oil, this is about maintained at from 4¼d. to 4⅜d. per gallon, naked, according to quality, with both home and export demand capable of considerable improvement. A rather limited demand is reported in respect of solvent naphtha values, of which are at 1s. 1¾d. to 1s. 2d. per gallon. Crude carbolic acid is quoted at about 2s. 6d. per gallon, naked, and crystals at 9½d. per lb. or thereabouts or odd parcels.

Company News

W. and H. M. Goulding.—A dividend of 3s. is announced on the ordinary shares.

British Cyanides Co.—An interim dividend of 5 per cent., less income tax, is payable on January 1 on the ordinary shares.

United Indigo and Chemical Co.—An interim dividend of 2½ per cent. is announced on the ordinary shares, payable on December 31.

Bleachers' Association.—The directors announce an interim dividend of 4d. per share, less tax, on the £3,793,737 ordinary share capital, as against an interim dividend of 6d. per share, less tax, last year.

San Sebastian Nitrate Co.—A trading loss of £1,922 is reported for the eighteen months to June 30, which is increased by reopening expenses, London charges, etc., to £13,049, making a total debit balance of £15,116. For 1927-28 there was a trading profit of £1,469, which was turned into a loss of £2,299 by stoppage expenses and other charges.

Imperial Chemical Industries, Ltd.—The company announces that the certificates for the preference and ordinary shares issued in May last are now ready to be exchanged for fully-paid allotment letters and/or transfer and balance receipts, which should be forwarded to the company's new issue office, Broadway Buildings, 50-64, Broadway, Westminster, London, S.W.1.

Joseph Nathan and Co.—The accounts for the year ended September 30, 1929, show a net profit, subject to audit, of £62,051, as compared with £61,216 for 1927-28. The report and accounts will be issued in March, when the annual general meeting will be held. The directors have declared the usual half-yearly dividend on the 7 per cent. preference shares, payable January 1, 1930, and will ask the shareholders at the annual general meeting to confirm the declaration and payment of a dividend for the year on the eight per cent. cumulative preferred ordinary shares.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

Tar or Tar Substitute.—The City Council of Johannesburg is calling for tenders, to be presented in Johannesburg by January 4, 1930, for the supply of tar or tar substitute. (Reference B.X. 5,914.)

Chemicals.—A firm of manufacturers' agents established in Colombo desire to secure the representation of British manufacturers of sulphuric acid, citric acid crystals and bicarbonate of soda. (Reference No. 615.)

Chemical Engineer's Claim Settled

At a sitting on Thursday, November 28, of the Anglo-German Mixed Arbitral Tribunal—the Court comprising Dr. H. Klaestad, Norwegian, president, Mr. Heber Hart, K.C., British member, and Dr. Wendriner, German member—it was announced by Mr. A. Cohn, counsel engaged in the matter, that a settlement in favour of claimant for £1,000, had been effected in a case against the German firm of Ehrhardt and Sehmer. The claimant was Mr. A. H. Lymn, gas and chemical engineer, consulting director of the Gas Power Co., and managing director of other companies, and his claim was for licence fees in respect of patents dealing with gas producer and by-product recovery plant. He had made an agreement before the war with the firm in Germany to exploit the patents and plants were being erected when the war broke out.

Billingham Developments

End of First Constructional Programme in Sight

ANOTHER interesting chapter in the story of great industrial development on the north bank of the River Tees—the Synthetic Works, Billingham—is contained (says the *North Mail*) in the latest report issued by Synthetic Ammonia and Nitrates, Ltd. It contains information that the end of the first big constructional programme undertaken by the firm is now almost in sight. The last unit (No. 5) of the nitrogen plant has entered upon the productive stage, and the production of ammonium sulphate (one of the forms in which the nitrogen is fixed) has increased to about 2,000 tons daily. This means that the original aim of converting Billingham into one of the largest nitrogen factories in the world has been achieved.

The production of nitrogen compounds in this country is now more than sufficient to supply all the Empire requirements for fertilisers, explosives and other purposes.

One of the unfortunate but inevitable happenings is that the time must arrive when such work is completed, and its cessation must mean that some of the men who have been engaged on it will lose employment.

To mitigate the effects of this, Synthetic Ammonia and Nitrates, Ltd., have made every possible provision. Though the completion of the programme will involve the gradual reduction in the number of those employees engaged in construction work, yet a large number are, and will continue to be, absorbed into process labour. It will be necessary also to dispense with the services of certain members of the staff, whose work had been mainly concentrated on construction. Every effort is being made to fill existing vacancies in other works of Imperial Chemical Industries, Ltd., with such members of the Billingham staff.

Billingham continues to expand in several other directions, the report adds. Work on the new alkali works on the south side of the factory is being urged on, and certain sections of the plant will shortly be in operation. This plant is particularly important because it takes the place of older factories at Wallsend, Maryhill and elsewhere.

Negotiations with the workers respecting transfers to Billingham have been much facilitated by Lord Melchett's scheme of Works Councils, which made it possible to arrange for the direct representatives of the workers to visit Billingham and to see the conditions of the new factory.

Insecticide Companies' Action

ON Friday, November 29, in the Chancery Division, Mr. Justice Eve had before him a motion by Mr. Moritz, K.C., on behalf of the Rex Research Corporation, Ltd., Le Fly Tox Société Anonyme and Tibo Products (International), Ltd., against Eric Magarey Trott, to restrain the defendant from disclosing to any person, firm or company any information relating to the manufacture or sale of a liquid insecticide obtained directly or indirectly from the plaintiffs, and from showing or parting with the possession of any samples, books, notes, etc., relating to the manufacture or sale of liquid insecticide containing information obtained from the plaintiff. Mr. Moritz said an interim order had already been made in the matter. Defendant had been in South Africa, and he came here to seek capital for a South African company or to arrange that he should be put in possession of the methods of manufacture of the insecticide, so that he could manufacture himself in South Africa. He had obtained samples from the English company, and had obtained the plaintiffs' secrets. Plaintiffs complained that defendant had written a letter asking for capital and threatening to disclose all information he had if he did not get what he wanted. The defence seemed to be that there was no confidential relationship between him and the plaintiffs, and secondly that there were no secrets in plaintiffs' preparations.

Mr. Trevor Watson read an affidavit by the defendant in which he said that the information which he had was not given him in confidence. If a secret formula existed, he said, he did not see it, and he had never seen it. He asked for a sample from the Tibo Co. because he wished to ascertain whether it would pass the Customs in South Africa free of duty. Counsel recognised that the defendant had written an improper letter, but it was done in a moment of pique.

The matter stood over for a week, the interim injunction being continued.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

GRAYS MANUFACTURING CO., Siebert Road, Westcombe Hill, S.E., oil refiners. (C.C., 7/12/29.) £14 10s. 11d. July 12.

KNOWLES (WM.), LTD., Acres Road, Bebington, manufacturing chemists. (C.C., 7/12/29.) £10 18s. 1d. October 31.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides and every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case, the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

ELTON COP DYEING CO., LTD., Bury. (M., 7/12/29.) Registered November 22, mortgage collaterally securing £30,000 mortgage dated August 8, 1919, to Major F. B. Stapleton-Bretherton, Altington House, Tetsworth, and another; charged on land at Elton. *Nil. May 1, 1929.

NEW PROCESS CO., LTD., Southall, manufacturing chemists. (M., 7/12/29.) Registered November 21, £3,405 mortgage, to Leeds Permanent Building Society; charged on properties at Scotts Road, Southall. *——. December 31, 1928.

New Companies Registered

GROSVENOR COLOURS, LTD., 21, Grosvenor Place, London, S.W.1. Registered November 28. Nominal capital, £5,000 in £1 shares (2,500 7 per cent. cum preference and 2,500 ordinary). Manufacturers of and dealers in dye-stuffs, fire and earth colours, chemicals, paints, varnishes, oils, enamels, cellulose, lacquers, printing works and printers' sundries, etc.

M. R. CHEMICAL PRODUCTS, LTD., 22, Basinghall Street, London, E.C.2.—Registered November 27. Capital, £8,000 in £1 shares (3,000 first preference, 4,000 second preference and 1,000 ordinary). To carry on the business of importers, exporters and manufacturers of and dealers in chemicals, heavy and fine chemical compounds and other products, dealers in chemicals, fertilisers, etc. A. V. Moss (chairman).

Manifesto on Imperial Trade

A MANIFESTO has been issued by representatives of British industry who, having carefully studied the economic and industrial position of world trade, have come to the conclusion that it is imperative to establish between all parts of the British Empire a policy of closer and more intimate mutual economic co-operation than exists to-day. Such a policy, they urge, is necessary in order to secure the full and rapid development of the agricultural, mineral, and manufacturing resources of the other nations and communities of the British Empire, as well as to maintain and develop the agriculture and the industry, employment and standard of living of the people of the United Kingdom. The secretary of the movement is Mr. Herbert G. Williams, 351, Abbey House, Victoria Street, S.W.1, and the signatories include Lord Melchett (Chairman, Imperial Chemical Industries), Lord Weir (Chairman, G. and J. Weir), Sir Robert Hadfield (Chairman, Hadfields, Ltd.), Sir Harry McGowan, (President, Imperial Chemical Industries), Sir William Larke (Director, National Federation of Iron and Steel Manufacturers), and the Hon. Henry Mond, M.P. (Director, Imperial Chemical Industries).